

November 2, 1875.

Dr. E. Hamilton, V.P., in the Chair.

The Secretary read the following reports on the additions to the Society's Menagerie during the months of June, July, August, and September 1875:—

The total number of registered additions to the Society's Menagerie during the month of June was 162, of which 49 were by birth, 54 by presentation, 45 by purchase, and 14 were received on deposit. The total number of departures during the same period, by death and removals, was 116.

The most noticeable additions during the month of June were as follows:—

1. A not quite adult Cassowary, received June 7th, having been brought from New Zealand by Dr. Hector, and presented to the Society by The Right Honourable Sir James Fergusson, Bart., F.Z.S., lately Governor of the Colony. This bird was obtained in 1873, when quite young, along with another similar specimen by the officers of H.M.S. 'Basilisk' from the natives of Touan or Cornwallis Island, a small island in Torres Straits, four miles distant from the south coast of New Guinea, and seventy miles from the opposite coast of Cape York. The natives are said to have captured the birds on the coast of New Guinea. The present specimen was conveyed in the 'Basilisk' to Wellington in July 1873, and had remained there ever since. When brought to Wellington it was supposed to have been about nine months old.

It appears to be most like the Australian Cassowary (*Casuarus australis*), but differs in its stronger legs and stouter form, as also in the throat-wattle being single and mesial, but divided at the extremity, as shown in the accompanying figure (Plate LVIII.). I believe it to be probably of the same species as that of the Aroo Islands, which I have lately described as *Casuarus beccarii* (*ante* p. 87).

2. A Black Wood-Hen (*Ocydromus fuscus*) from Snares Island, south of New Zealand, presented by Dr. G. Hector, F.R.S., C.M.Z.S., June 7th, being the first example of this species of *Ocydromus* which we have received.

3. A young male brown Indian Antelope of the southern form; in which the front pair of horns are barely apparent (*Tetraceros subquadricornutus*, Elliot\*), purchased June 8, 1875. Dr. Jerdon does not distinguish this animal from the northern *T. quadricornis*; but Sir Victor Brooke tells me he thinks that the two forms must be kept separate.

4. A female Grant's Gazelle (*Gazella granti*, Brooke) from East Africa, presented by Dr. John Kirk, C.M.Z.S., June 10th.

The arrival of a living example of this fine Gazelle, which has

\* *Antilope subquadricornutus*, Elliot. Madras Journ. x. p. 225, pl. 4. fig. 2; *Tetraceros subquadricornutus*, Gray, P. Z. S. 1850, p. 117.

Plate LIX.  
June 1875

only recently been described by Sir Victor Brooke from drawings\*, is of great interest. Unfortunately the animal was in a very feeble state when received, and died very shortly. I now exhibit the mounted specimen (Plate LIX.). The height of this animal at the shoulders is 28 inches, the length of the horns 7.25 inches.

I have also to call attention to the breeding of the Spotted-billed Duck of India (*Anas pæcilorhyncha*) in these Gardens, which took place for the first time in June last. We received our first males of this beautiful species from the Babu Rajendra Mullick in August 1868 (see P. Z. S. 1868, p. 649). In May 1872, five females were presented by Mr. E. Buck (see P. Z. S. 1872, p. 729). The pairs thus formed, however, never bred until the present year, when two young birds were hatched by one female on the 2nd of June, and seven by another on the 14th of the same month. The male and female of this duck are so much alike that (as I am informed by Mr. Clarence Bartlett, the Assistant Superintendent, who has charge of the breeding Anatidæ) the only certain means of distinguishing the sex is by the note. The nest and number of eggs also much resemble those of *Anas boschas*. The young are undistinguishable from the young of the same species.

I exhibit specimens of the eggs.

The registered additions to the Society's Menagerie during the month of July were 202 in number; of these, 37 were acquired by presentation, 113 by purchase, 1 by exchange, 30 by birth, and 21 received on deposit. The total number of departures during the same period by death and removals was 94.

The most noticeable additions during the month were:—

1. A pair of Giant Tortoises (*Testudo indica*) purchased July 6. These Tortoises are originally from Aldabra Island in the Indian Ocean, but have been kept (the male, it is said, for upwards of 70 years) in captivity in the Seychelles, and have been forwarded thence by Mr. C. S. Salmon, the Chief Commissioner for the Islands, under the care of Dr. Brooks, Government Medical Officer. The shell of the male measures about 4 ft. 1 in. by 3 ft. 1 in.; and his weight is estimated at 800 lbs. We have to thank Dr. Günther (who arranged with Mr. Salmon for the transmission of these last relics of an extinct race to this country) for allowing them to remain, so long as they live, in our Garden. When they die they are to be transferred to the British Museum †.

2. A female Sumatran Rhinoceros (*Rhinoceros sumatrensis*) deposited July 14 by Mr. C. Jamrach. This animal seems to resemble very nearly the individual of the same species formerly in our Gardens, which died in 1872. It is stated to have been captured in the territory of Johore, Malay peninsula.

3. A collection of small birds from S.E. Brazil, purchased July 19, amongst which are specimens of two beautiful little Tanagers

\* See P. Z. S. 1872, p. 601, pl. xli.

† See Dr. Günther's remarks on these Tortoises and their allies. Ann. Nat. Hist. ser. 4, vol. xiv. p. 311 (1874), and Nature, xii. pp. 238 & 259.

Plate LIX.  
see p. 624.

(*Calliste festiva* and *Euphonia pectoralis*) new to the collection, and, so far as I know, never previously received alive.

4. A very fine male Chimpanzee (*Troglodytes niger*), presented by Captain Lees, Governor of Lagos, July 19. The first set of teeth have been already shed, which is rarely the case in examples of the Chimpanzee brought to this country.

5. An Electric Silurus (*Malapterurus beninensis*) from West Africa, purchased July 21st, being the first example of this singular fish brought to our Gardens. On touching its belly with the finger a slight electric shock is at once given forth. The fish is about 5 inches long.

6. A young female Tora Antelope (*Alcelaphus tora*) from Upper Nubia, purchased July 22nd, being the first example of this eastern form of the Bubal which has reached us alive. The colour and shape of the body appear to be nearly identical with those of the Bubal; but the horns of the adult male (as I have shown, P. Z. S. 1873, p. 762) are very different.

7. A young male Wild Sheep, apparently *Ovis cycloceros*, presented July 28th, by Commander Edmund St. J. Garforth, R.N. of H.M.S. 'Philomel,' who writes to me that he obtained it in Muscat, on the shores of the Persian Gulf, which I should not have supposed to be within the range of this species.

The total number of registered additions to the Society's Menagerie during the month of August was 94; of these, 52 were acquired by presentation, 12 by purchase, 13 by birth, 1 by exchange, and 16 received on deposit. The total number of departures during the same period by death and removals was 94.

The most noticeable additions during the month were:—

1. A young female Manatee (*Manatus americanus*), deposited August 6th by Mr. R. Swain, of Demerara, and subsequently purchased for £150. This animal was conveyed to England, on board the S.S. 'Blenheim,' Captain Robiison, in a large wooden tank slung upon a horizontal pole, and was fed during the voyage on the leaves of a large aquatic plant resembling the water-lily (*Nymphaea*), shipped for the purpose. It was about three weeks on the voyage. On its arrival in the Gardens, it was placed in one of the shallow concreted ponds near the Sea-lion's basin, and fed on lettuce and vegetable marrow. It lived in apparently good health until September 7th, when it died very suddenly. Mr. Garrod is preparing some notes upon this interesting animal, which is the first of the species that has actually reached us alive, although Mr. C. Bartlett nearly succeeded in bringing us one from Surinam in 1866\*.

2. Two young Gannets, probably the young of the Brown Gannet or Booby (*Sula fusca*), but still partly in the down plumage, and therefore not certainly determinable. These birds were obtained from Port Lemon, Costa Rica, by J. C. Hussey, and presented by that gentleman August 16th.

3. A Woodford's Owl (*Syrnium woodfordi*) from Natal, presented

\* See Trans. Zool. Soc. viii. p. 192.

August 16th by Mr. W. E. Oates, being the first example we have received of this scarce bird.

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The total number of registered additions to the Society's Menagerie during the month of September was 104; of these, 43 were acquired by presentation, 22 by purchase, 16 by birth, 8 by exchange, and 15 were received on deposit. The total number of departures during the same period by death and removals was 111.

The most noticeable additions during the month were as follows:—

1. A White-faced Owl (*Sceloglaux albifacies*) from New Zealand, purchased 3rd September 1875, new to the collection.

2. A wild Dog, presented by Mr. Mumford, 7th Sept. 1875. This animal was formerly in Mauders's Travelling Menagerie, and was sold when that collection was dispersed by auction in the Agricultural Hall in August last, to Mr. Mumford, who has obligingly presented it to the Society. Its origin is unknown; but, as far as can be ascertained from examination of the living specimen, it would appear to be an adult male of the Wild Dog of Sumatra (*Canis rutilans*, Temm.). It has been placed in the same cage along with its near ally, the female Indian Wild Dog (*Canis primævus*), received from Lord Northbrook in March last.

3. An American Darter (*Plotus ankinga*), from South America, purchased 30th September, 1875. The Society now possesses two living examples of this interesting bird. The first one, obtained 28th December, 1872 (see P. Z. S. 1873, p. 2, where there is an excellent drawing of this bird), is now in adult plumage; the last arrival is in immature dress.

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The following translation of a letter addressed to the Secretary by M. L. M. D'Albertis, C.M.Z.S., was read:—

“Yule Island, May 24, 1875.

“Since the 14th of March I am on this island, at the south of New Guinea, from which it is divided by a few miles of sea only. I have already made several excursions on the Papuan coast, and succeeded in penetrating a little way inland—not really far, it is true, but far considering the circumstances of my situation, and the country in which I am.

“First of all, I may observe that the general aspect of the country resembles that of the north of Australia much more than the north of New Guinea. On the coast the beautiful forest-trees are wanting, and *Eucalypti* abound in their place, and there are large open spaces covered only with long grasses and small shrubs or “scrub,” as you call it. There are also lagunes. The climate is dryer than in the north. When I ascended the mountains a little and penetrated the interior, the Australian plants disappeared, and those more specially Papuan were again found. In the same way as the flora, the fauna of the coast shows much affinity to that of Northern Australia; and in one of the lagunes I have seen in abundance *Parra gallinacea*, *Porphyrion melanotus*, and a species of *Lobivanellus*, of which I cannot tell

the name certainly, as I have not yet obtained specimens. Moreover, at early dawn and after sunset I have several times heard the notes of a *Dacelo* which might be *D. leachi*; and in this island for some time *Scythrops australis* was common, while on the opposite coast of New Guinea I obtained good examples of *Chlamydodera cerviniventris*. I could add the names of many other Australian species. On the other hand, on the mountains, besides *Paradisea raggiana*, there are to be found *Cicinnurus regius*, *Pitta novæ guineæ*, *Eupetes cærulescens*, and *Campephaga aurlenta*. Of the last I obtained the female, which differs from the male in having the throat cinereous. But these are not the only species which give a Papuan tint to the mountain-birds; for there is also to be met with *Lophorina atra*, of which I have seen many feathers used by the natives for ornament, as also of *Sericulus aureus*, called by the natives "*Horobora*." Certainly along with the *Sericulus* and *Lophorina* would be found the other Paradise-birds that in the north inhabit the same localities as these species.

"Serpeants I find much more numerous here than in the north of New Guinea, especially the venomous ones, and not only of Australian genera, but even of Australian species. Of *Acanthophis antarctica* I have obtained two examples, which differ slightly from each other, and very much from the Australian form; but I take it for the same species. The Coleoptera and Lepidoptera are, like the birds, near the coast more Australian than Papuan; and the reverse is the case in the interior. But *Pieris aruna*, which is so common at Cape York, I have found also on the mountains.

"Up to the present time I have not formed an exact idea as to the Mammals, but am inclined to believe that they are very scarce. I have only obtained a *Cuscus* (probably one of many varieties of *C. maculatus*), a *Belideus*, a few species of insectivorous Bats, a *Pteropus*, two Bats, and the so-called *Sus papuensis*, of which last I have not seen two alike amongst a hundred. The *Halmaturus luctuosus* is very common, inhabiting the mountains as well as the plain—but always where the forest is most dense. It abounds on the lower hills, and forms one of the principal sources of food for the natives, who capture it in numbers in strong nets. I have had the opportunity of examining a large number of this species, and find them identical with the individual described by me in the 'Proceedings'\*, which, I hope, is still living in the Society's Gardens. But upon further examination I find that the canine teeth, which did not exist in the individual described by me at the time of my description and even subsequently, are, on the contrary, always present in examples of every age which I have recently examined here. Consequently, after considering its dentary system, I have come to the conclusion that this species is not correctly placed in the genus *Halmaturus*, but ought to be referred to the genus *Dorcopsis*, to which, as it appears to me, its principal generic characters assimilate it rather than to any other genus of Macropodidæ. The Kangaroos which Dr. Beccari sent from the Aroo Islands to the Museo Civico of Genoa may also belong to the genus *Dorcopsis*, but are certainly distinct from *D. luctuosa*, as I think

\* P. Z. S. 1874, p. 110; see also P. Z. S. 1874, p. 247. pl. xlii.

the present animal should now be called. I have also obtained a second species of Kangaroo, which I believe to be new, but have not been able to determine accurately, from the specimen being immature and its dentition imperfect\*. The adult animal, of which I have seen several individuals in the forest, is larger than *D. luctuosa*.

“In the river, along which I penetrated into the interior some way, Crocodiles were abundant. In two hours I saw nine, large and small, but only one of really considerable size. Here also near this island on calm days I have often seen them; and, judging from their heads, which they thrust out of the water, they must be of large size. They seem to have fixed places in which they pass many hours of the day; for passing many times I always see them at the same posts.

“I was rather fortunate in my excursion into the mountains; for I found *Paradisea raggiana*, and obtained some beautiful specimens in full dress. In its voice, in its movements, and in its attitudes, it perfectly resembles the other species of the genus. It feeds on fruit; and I could find no trace of insects in the seven individuals which I prepared. It inhabits the dense forest, and is generally found near the ravines—perhaps because the trees on the fruit of which it feeds prefer the neighbourhood of water. The female is always smaller in size than the male; and I find this sex less abundant, because, as I believe, it is the season of incubation. The female is more like the same sex of *P. apoda* than that of *P. papuana*. The young male is like the female, but often recognizable by having distinguishable traces of the yellow collar which in the old male divides the green of the throat from the breast-feathers. The irides are of a rather bright yellow, and the feet lead-colour with a reddish tinge. The long flank-feathers in individuals recently killed have a very bright tint, which they lose in a few days—even in a few hours. The two middle tail-feathers are filiform, as those of *P. apoda* and *P. papuana*, and in no stage of development resemble those of *P. rubra*. These two feathers are not so long as in *P. apoda*, and about equal to those of *P. papuana*. Like its sister species, *P. raggiana* is an inquisitive bird, and often approaches from branch to branch within a few yards of the hunter, and remains motionless for some seconds to observe its pursuer, stretching out its neck, flapping its wings and emitting a peculiar cry, upon the sound of which other individuals come forward to join it. When one is wounded and cries out, many others come forward as if to protect it, and approach quite near, descending to the lowest boughs. The adult males frequent the tops of the highest trees, as Mr. Wallace observed in the other species, and as I also remarked in my former expedition. As regards the nidification I have as yet obtained no information.”

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A letter was read from Mr. Walter J. Hoffman, dated Reading, Pennsylvania, U.S.A., July 15th 1875, containing a sketch of a horn of an American Pronghorn (*Antilocapra americana*) with a double prong.

\* [Probably *Macropus papuensis*, lately described by Peters and Doria from M. d'Albertis's specimens, Ann. Mus. Gen. vii. p. 344.—P. L. S.]

The sketch had been taken from the original at the Grand-River Indian Agency, Dakota Territory, while Mr. Hoffman was stationed there as Surgeon in 1872. The horn had been used as a charm by one of the chiefs of Sioux Indians; and Mr. Hoffman had been informed by him that both horns of the animal were alike. The one in



Horn of *Antilocapra americana*, with double prong.  
*a*, perforation for cord; *b*, artificial edge, cut by wearer.

question had been perforated and attached to a buckskin thong, and in this manner worn about the neck. The specimen had been afterwards purchased by the Hospital Steward, who had it in his collection still when Mr. Hoffman wrote.

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Mr. Sclater read a letter from Captain J. Moresby, R.N., stating that the young example of *Casuarium uniappendiculatus* presented by him to the Society on the 25th August, 1874, had been obtained on the 29th of May, 1874, on the western extremity of New Guinea, at a place called "Threshold Bay" in lat.  $1^{\circ}$  south and long  $132^{\circ}$  east (approximately), about 20 miles to the north of the island Salawatti.

The statement respecting the origin of this bird given on Dr. Bennett's authority (P. Z. S. 1875, p. 84) was therefore incorrect, the bird there alluded to by Dr. Bennett under the name *Casuarium uniappendiculatus* having been the example of *Casuarium beccarii* above referred to (p. 527), which had been obtained by the 'Basilisk' on a previous occasion.

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The following papers were read:—

1. Notice sur l'*Elopichthys dahuricus*. Par P. BLEEKER,  
F.M.Z.S.

[Received June 22, 1875.]

(Plate LX.)

M. le docteur G. E. Dobson a bien voulu avoir l'obligeance de me faire parvenir, par l'entremise de M. Francis Day, un poisson de Chine, provenant du fleuve Yang-tse-kiang, et faisant partie des collections du Netley Museum of the Army Medical Department. Le poisson avait été étiqueté "*Opsariichthys*," et M. Dobson me pria d'en faire la description. Le poisson est sans aucun doute un *Elopichthys*, et de l'espèce figurée par Basilewski sous le nom de *Naseus dahuricus*.

L'espèce du poisson du Netley Museum n'est donc pas inédite, mais il reste incertain si le *Naseus dahuricus*, Bas., soit spécifiquement distinct ou non de l'*Elopichthys bambusa* ou du *Leuciscus bambusa*, Rich.

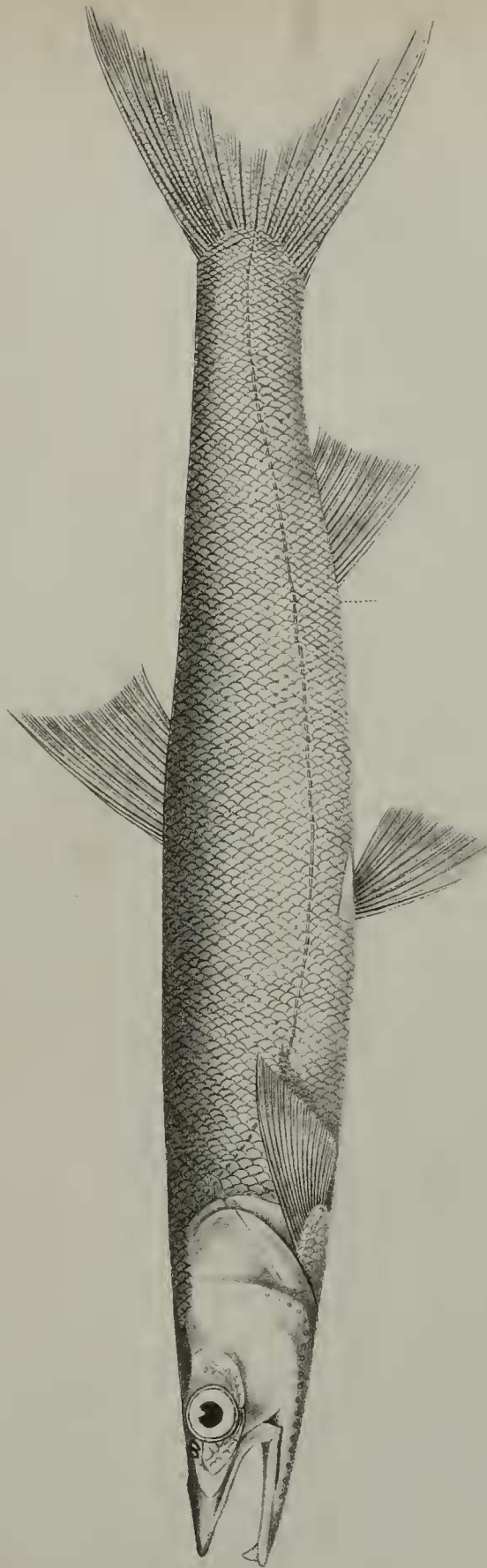
M. Günther cite le *Naseus dahuricus* comme synonyme du *Leuciscus bambusa*, mais seulement avec un point de doute. Ce point de doute me semble bien justifié et je pense qu'on ait affaire ici à deux espèces bien distinctes.

Les figures publiées par Basilewski et Richardson présentent une physionomie fort différente. Celle du *Leuciscus bambusa* montre la mâchoire inférieure plus longue que la supérieure, et la queue beaucoup moins haute que celle du *Naseus dahuricus*, mais étant prise sur un individu adulte et empaillé, il est probable qu'elle ne rende pas exactement la forme de la queue.

Les formules des nageoires aussi sont différentes pour les deux formes, mais il est probable que les rayons n'aient pas été comptés exactement. Les formules données par Basilewski, Richardson et M. Günther ne cadrent pas entre elles, ni aussi avec celles que je trouve sur l'individu du Netley Museum. M. Günther a examiné le type même du *Leuciscus bambusa*. Il en donne la formule des écailles : L. lat. ca. 100, L. transv.  $\frac{20}{15}$ , en y ajoutant, dans le texte de la diagnose, "there are nine longitudinal series of scales between the lateral line and ventral fin." Cette formule est tout différemment rendue sur la figure du *Leuciscus bambusa*; mais si celle de M. Günther est exacte le *bambusa* ne peut pas être de la même espèce que le *dahuricus*. Quant au *Basilus (Opsarius) bambusa*, Kner, l'auteur en dit expressément que les individus de Shanghai qu'il en a eus sous les yeux avaient plus de ressemblance avec la figure du *Naseus dahuricus* qu'avec celle du *Leuciscus bambusa*.

En attendant qu'une comparaison de l'individu du Netley Museum au type Richardsonien puisse faire juger positivement, je considère le *dahuricus* et le *bambusa* comme espèces distinctes. On verra par la figure ci-jointe, et parfaitement exacte, qu'elle répond beaucoup mieux à la figure du *Naseus dahuricus* qu'à celle du *Leuciscus bambusa*.





J. Smit lith.

ELOPICHTHYS DAHURICUS

M & N Harbort imp



## ELOPICHTHYS DAHURICUS. (Plate LX.)

Elop. corpore elongato compresso, altitudine 6 circ. in ejus longitudine absque,  $7\frac{1}{2}$  circ. in ejus longitudine cum pinna caudali; latitudine corporis  $1\frac{3}{4}$  circ. in ejus altitudine; capite acuto  $3\frac{3}{4}$  circ. in longitudine corporis absque,  $4\frac{2}{3}$  circ. in longitudine corporis cum pinna caudali; altitudine capitis 2 circ., latitudine capitis 3 circ. in ejus longitudine; oculis diametro 6 circ. in longitudine capitis, diametro  $1\frac{1}{2}$  circ. distantibus; linea rostro-frontali rectiuscula; rostro acuto cum maxilla oculo duplo circ. longiore, apice ante medium oculum sito, multo longiore quam basi lato; naribus ante oculi marginem superiorem perforatis, septo gracili valvuliformi separatis; osse suborbitali anteriore oblique pentagono apice sursum spectante; ossibus suborbitalibus ceteris gracilibus longioribus quam latis; maxillis subæqualibus acie scabriusculis; maxilla superiore non protractili, sub oculi dimidio anteriore desinente, postice curvata, parte intermaxillari prærostrali conica dimidiam rostri totius longitudinem efficiente; maxilla inferiore superiore vix brevior, symphysis processu conico elevato subhamata; labiis gracilibus, superiore sulco longe ante apicem maxillæ desinente, inferiore sulco symphysim subattingente, præoperculo subrectangulo, angulo obtuse rotundato, limbo postero-inferiore poris conspicuis uniseriatis; operculo lævi minus duplo altiore quam longo, margine inferiore rectiusculo; osse scapulari triangulæ obtuso; dentibus pharyngealibus triseriatis, compressiusculis, leviter uncinatis, 2, 4,  $5/4$ , 4, 2, longioribus; facie masticatoria concava gracili; dorso humillimo; cauda parte libera postanali minus duplo longiore quam alta, parte gracillima altitudine 4 circ. in longitudine dorsalem inter et basin pinnae caudalis 100 circ. in serie longitudinali angulam aperturæ branchialis superiorem inter et basin pinnae caudalis, 22? circ. in serie transversali basin pinnae ventralis inter et dorsalem, quarum 15 vel 16? lineam lateralem inter et dorsalem; linea laterali singulis squamis tubulo simplici notata, mox post scapulam valde descendente, lineæ ventrali triplo magis quam lineæ dorsali approximata; cauda postice sursum curvata et media basi pinnae caudalis desinente; pinna dorsali medio aperturam branchialem inter et basin caudalis inserta, capite plus duplo brevior, corpore non humiliore, acuta, emarginata, antice quam postice plus triplo altiore; pectoralibus lineæ ventrali approximatis, subhorizontaliter insertis, capitis parte postoculari non vel vix longioribus; ventralibus paulo ante dorsalem insertis, anali quam basi pectoralium paulo propinquioribus, acutis, pectoralibus paulo brevioribus?; anali longitudine et forma dorsali æquali sed ea humiliore; caudali profunde incisa, lobis acutis, capite paulo brevioribus; colore corpore superne viridi, lateribus et inferne argenteo; iride argentea vel flavescente, pinnis flavescentibus vel ex flavescente roseis.

B. 3. D. 3/11 vel 3/12. P. 1/19 vel 1/20. V. 1/9.

A. 3/12 vel 3/13. C. 9/17/8 lat. brev. incl.

*Naseus dahuricus*, Bas. Ichth. Chin. bor., Nouv. Mém. Moscou, x. p. 234.

*Naseus dauricus*, Bas. ibid. tab. 7. fig. 1.

*Elopicthys dauricus*, Blkr. Act. Soc. Sc. Ind. Neerl. vii. Cyprin. p. 286.

*Basilus (Opsarius) bambusa*, Kner, Zool. Reis. Novara, Fisch. p. 357.

*Hab.* Sina, in flumine Yang-tse-kiang (*test. clar. Dobson*). Longitudo speciminis descripti, 235'''.

La Haye, 20 Juin, 1875.

## 2. Description of a new Species of *Carinifex* from California.

By EDGAR A. SMITH, F.Z.S.

[Received June 23, 1875.]

A very peculiar form of *Planorbis*, from California, was described by Mr. Isaac Lea in the Proceedings of the Academy of Philadelphia, 1854, p. 51, under the name *P. newberryi*.

Subsequently Mr. G. Binney deemed this so remarkable a shell as to merit generic rank, and consequently he proposed to distinguish it by the name *Carinifex* (see Cat. North-American Pulmonata, Dec. 9, 1863).

The same idea appears to have occurred to Mr. Lea himself; for in January of the succeeding year (Proc. Acad. Philad. Jan. 1864) he describes his species with the generic title of *Megasystropha*.

In neither instance is a diagnosis given; but in the American Journ. Conchol. i. 1865, p. 50, Binney describes *Carinifex* and figures *C. newberryi* on pl. 7. figs. 6, 7.

He also mentions the existence of a second species, *C. breweri* of Newcomb, and observes, "the latter (*C. breweri*) may prove but a variety of the former" (*C. newberryi*).

Whether this be the same as the following species or not I cannot say; but all search to find the description of any species entitled *C. breweri* has been in vain.

### CARINIFEX PONSONBII, sp. nov.

*Testa subdiscoidalis, tenuis, latissime et profundissime umbilicata, corneo-alba, epidermide fugaci tenuissima pallide olivacea induta; anfractus 5, convexiusculi, rapide accrescentes, superne paululum suturam infra obsolete angulati, incrementi striis perarcuatis exilissime sculpti, sutura profunda discreti; spira parum supra anfr. ultimum elevata; anfr. ult. maximus, superne late sed minime profunde excavatus, infra excavationem aliquanto carinatus, infra carinam leviter convexiusculus, inferne circa umbilicum subobtusè carinatus; apertura magna, triangularis, inferne subcanaliculata, superne leviter ascendens;*

*peristoma continuum, ad margines superiorem labralemque aliquanto expansum.*

Diam. max. 20 mill. Diam. min. 15. Alt. 16.

*Hab.* California.

This very remarkable species was collected in California by Lord Walsingham; and two specimens were presented to the British Museum by Mr. J. H. Ponsonby—a most enthusiastic conchologist, with whose name I feel much pleasure in associating the species.

It has but one relation of any proximity, namely *C. newberryi*, Lea. From this it differs in being of a thinner and lighter build, in



*Carinifex ponsonbii.*

the more rapid increase of the whorls, and consequently in the proportionally much larger size of the last in comparison with the penultimate. *C. newberryi* has the upper surface of the whorls broadly flattened and then acutely keeled and angulated, whereas in the present species they are rather convex, lack the carination, and display but the faintest approach to an angulation, and this is situated near the *upper* and not the *lower* suture. Again, the mouth of the latter species ascends a little on the body-whorl; in the former it descends a trifle. Finally, Lea's shell is much more coarsely striated, and clothed with a strong yellowish-olive epidermis, whereas that which invests the present species is very thin and of a very pale olive tint. On each side of the rounded keel, encircling the umbilicus, there is a shallow depression.

### 3. Remarks on the Genus *Alaba*, with the Description of a new Species. By EDGAR A. SMITH, F.Z.S.

[Received June 23, 1875.]

The genus *Alaba* was first characterized by Messrs. H. and A. Adams in the 'Genera of Recent Mollusca,' p. 214, and there considered as a subgenus of *Cerithiopsis*.

Subsequently it was raised to the rank of a separate genus and removed by A. Adams (see *Annals & Mag. Nat. Hist.* 1862, x. p. 294) to the subfamily *Litiopinæ*.

Here the shells included in the group are described "anfractibus plicatis seu varicosis, vertice submammillato. Apertura ovata, labio sæpe vix truncato." No mention is made of the nature of the operculum.

Of the species which he enumerates, *A. picta*, *A. cornea*, *A. felina*, *A. inflata*, and *A. phasianella*, Angas (since described), have whorls smooth and not plicate or varicose, and the labium exhibiting, in *A. picta* only, but the faintest approach to a truncation, the columella in the remaining species being rather straight, and generally blending into the labrum, which is slightly effuse at the base.

Thus it will be seen that the characters assigned to the genus are not quite accurately applicable to all the species which have been included therein; and therefore I would propose the following divisions, which may somewhat facilitate their identification.

Those species which have the whorls strengthened with varices (generally tumid) and the columella more or less (for this character is variable) truncated, will constitute the genus *Alaba* proper; and those devoid of the varices and wanting the columellar truncation may form the subgenus *Diala*, A. Adams, *l. c.* 1861, viii. p. 242, and 1862, x. p. 298. The subgenus *Styliferina*, A. Adams, *l. c.* p. 299, is closely associated with the preceding group; indeed there scarcely appear characters sufficient to warrant a separation. The chief peculiarity mentioned as distinguishing this form is in the apex "vertice mucronato;" but it does not differ to any material extent from that of several of the typical species.

#### ALABA.

Whorls tumidly varicose; columella more or less truncated; labrum thickened in the adult state.

*A. vibex*, A. Ad.; *A. tervaricosa*, C. B. Ad.; *A. melanura*, C. B. Ad.; *A. supralirata*, Carpenter; *A. zebrina*, A. Ad.; *A. leucosticta*, A. Ad.; *A. blanfordi*, A. Ad.; *A. puncto-striata*, Gould.

#### Subgen. DIALA.

Whorls not varicose (sometimes noded around the middle; columella straightish, not truncated; labrum not thickened.

*D. lauta*, A. Ad.; *D. suturalis*, A. Ad.; *D. varia*, A. Ad.; *D. sulcifera*, A. Ad.; *D. picta*, A. Ad.; *D. pulchra*, A. Ad.; *D. imbricata*, A. Ad.; *D. monile*, A. Ad.; *D. pagodula*, A. Ad.; *D. phasianella*, Angas; *D. (Alaba) tenuis*, Smith; *D. cornea*, A. Ad.; *D. simplex*, Smith.

*Diala rufilabris*, A. Ad., differs essentially from this genus in that the peristome is continuous, very much thickened everywhere, and the aperture oblique, the columella being consequently oblique also, and not more or less perpendicular as is the case in all the species in this group. Thus it will be seen that it should be removed to the genus *Hydrobia*.

With the exception of *Alaba puncto-striata*, Gould, all the species above enumerated are represented in the British Museum, as are also those species described by P. P. Carpenter in the 'Catalogue of Mazatlan Shells.' But these, with one exception, I have purposely omitted; for the mutilated condition of the specimens is such that it is impossible to say to what genus they (when perfect) may have belonged.

And here I cannot refrain, although always averse to censuring criticism, from condemning most energetically that pernicious practice of describing fragments of minute specimens and assigning specific names to them. It merely results in burdening science with a mass of literature almost useless; for it is simply an impossibility for any one to identify their specimens from the description of those miserable fragments characterized in the Mazatlan Catalogue. Describe them and welcome, for no harm is thereby done, albeit but little good; but for the sake of others let us not name them.



*Diala leithii.*

*DIALA LEITHII*, sp. nov.

*Testa imperforata, ovato-fusiformis; spira acuminata, tenuis, parum nitida, sordide flavida, fasciis spiralibus angustis rufis parum conspicuis ornata, una circa medium anfr. superiorum, duabus in ultimo, altera paululum supra, altera paululum medium infra; anfractus 9, convexi, medio levissime angulati, spiraliter aequidistanter striati, striis in anfr. superioribus circiter 8, in ultimo ad 18; sutura parum obliqua, profundiuscula; apertura ovata, ad basin acuminata effusa, longitudinis totius ad  $\frac{5}{13}$  aequans, fasciis externis bifasciata; columella arcuata leviterque incrassata; labrum tenue, simplex.*

*Operculum corneum, tenue, paucispirale, nucleo subcentrali.*

Long.  $7\frac{1}{2}$  mill. Diam. fere 3.

*Hab.* California.

The angulation of the whorls is very slight in most specimens, and in some altogether absent. The spiral reddish bands are not very observable, but are more distinctly observable within the aperture; indeed that which encircles the middle of the upper whorls is so faint as to be scarcely visible. The operculum consists of about three volutions; and its nucleus is situated at about one fourth the entire length from the inferior margin. Dr. Leith, who has kindly presented a good series of this species to the Museum, enclosed with them the following notes, which he made respecting the animal when observing it alive.

"*Lip* somewhat probosciform, not used in progression, and not usually projecting beyond the edge of the foot.

“*Tentacles* two, long, subulate or filiform, bearing the *eyes* on their outer side near the base.

“*Foot* much expanded in front and rounded, gradually attenuated posteriorly and caudated.

“*Reptation* not by alternate movements of right and left sides, but by uniform, undulating, progressive motion of the foot on the sides of the vessel in which it was captive.

“It moved also in an inverted position along the surface of the water, as *Planorbis* and *Lymnæa* do,” as does also *Diala picta*.

Notwithstanding this species does not altogether agree with *Diala*, both as regards the shell and animal (that is, of *D. picta*), I deem it unadvisable *at present* to form a distinct subgenus for its reception. The differences in the shell consist in the columella being more arcuate than is usual, and the aperture more than ordinarily acuminately effuse at the base.

The animal varies from that of *D. picta* in having the tentacles of equal (and not unequal) length, the foot not auriculate, and in the four long tentacular filaments attached to the operculigerous lobe being wanting. These peculiarities in the animals certainly appear to be sufficient to dissociate them; but until more complete and accurate investigations have been made on these and other species of this genus, I shall refrain from adding to the already superfluous number of genera one so ill defined.

#### 4. Notes on the Figures of *Herpestes ferrugineus* and *Ovis polii*. By W. T. BLANFORD, F.Z.S.

[Received July 5, 1875.]

In the plate of *Herpestes ferrugineus* published in the ‘Proceedings’ for 1874 (plate lxxxii.) there is a slight error, to which, however, it is as well to call attention. The animal is represented on a tree. Now all the Indian and African species of Mongoose with which I am acquainted (*H. griseus*, *H. malaccensis*, *H. persicus*, and others) are thoroughly terrestrial in their habits, and rarely, if ever, climb trees. The plate was, of course, drawn after I left England, and is, I think, a good representation of the animal.

There are, however, some very serious errors in the figure of *Ovis polii*\* (pl. liii.). I have examined a series of skins brought from Kashgar; and I find that none possesses a trace of the mane along the neck, represented in both sexes in the plate; there is some long hair behind the horns, and a little between the shoulders, but none on the back of the neck. In the plate, too, the male standing up has a long bushy tail, and the female lying down has a black line down the back. Both these peculiarities, I regret to say, are due to the artist: the animal has really a very short tail, so short that in life it can

\* I think this, and not *O. poli*, is the correct mode of spelling this animal's name.



scarcely be seen in general; and there is no trace of a dark line down the back. The general colour of the animals, as figured, is too rufous; the lower parts are not sufficiently white; and the horns in the male are poorly drawn.

It is only due to Dr. Stoliczka to point out that the drawing from which the plate was taken was not sent by him, and that he is only responsible for the description, p. 425, in which it will be seen that no mane or dorsal stripe is mentioned, and that the length of the tail is given as only 4 inches. The drawing was by Col. Gordon, who of course is not a naturalist; but I can hardly suppose that the mistakes mentioned were made by any one having the animal before him. In any case it is essential to point out these errors before somebody invents a new genus for this long-tailed and maned type of the genus *Ovis*.

5. Description of two new Species of Birds from the State of Antioquia, U. S. C. By P. L. SCLATER, M.A., F.R.S., and OSBERT SALVIN, M.A., F.R.S.

[Received July 9, 1875.]

Mr. T. K. Salmon, who has now returned to his former quarters at Medellin, the capital of the the Columbian State of Antioquia, has sent us a new collection of birds, formed in the neighbourhood of that city. Amongst these are single examples of two species which appear to be new to science\*, and which we propose to describe as follows:—

*CATHARUS PHÆOPLEURUS*, sp. nov,

*Supra olivaceo-brunneus*: dorso, collo postico et capite toto, nisi in gula, fusco-griseis: subtus in gula et abdomine medio albus, illa plumbeo variegata: pectore et hypochondriis griseo-plumbeis: rostro et pedibus flavis: long. tota alæ 6·3, caudæ 2·3, rostri a rictu, 0·85 poll. Angl.

*Hab.* in Statu Antioquiensi reipublicæ Columbianæ.

*Obs.* A *C. mexicano* capite griseo et pectore hypochondriisque magis plumbeis, a *C. fuscato* dorso olivaceo-brunneo et capitis colore, necnon a *C. griseicipite* dorso obscuriore et coloribus corporis inferioris diversus.

*Mus.* P. L. S.

This species of *Catharus*, of which Mr. Salmon sends but a single specimen, resembles several distinct species of the genus, being somewhat intermediate in its characters between the black-headed group represented by *C. mexicanus* and *C. fuscater*, and the grey-headed *C. griseiceps*, which belongs more properly to the group represented by *C. melpomene*.

The discovery of *C. phæopleurus* raises the number of species of this genus now known (*i. e.* if we allow *C. maculatus* to be di-

\* The species described as new from Mr. Salmon's former collection from this district were *Chlorochrysa nitidissima*, *Scl. P. Z. S. 1873*, p. 728, *Grallaria ruficeps*, *Scl. P. Z. S. 1873*, p. 729, and *Tigrisoma salmoni*, *Scl. et Salv. P. Z. S. 1875*, p. 38.

stinct from *C. dryas*, a question open to doubt) to eleven, all of which are found either in the north-western districts of S. America or in Central America.

*AUTOMOLUS HOLOSTICTUS*, sp. nov.

*Supra niger, usque ad medium dorsum flammulis longis pallide cervinis ornatus: alis et dorso inferiore brunneis, scapularium scapis cervinis: uropygio et cauda tota rubiginoso-rufis: subtus cernuus, in ventre magis brunnescens; plumarum marginibus fuscis, et harum scapis clare cervinis: rostro saturate corneo, pedibus fuscis: long. tota 8.5, alæ 3.3, caudæ rectr. med. 3.7, ext. 2.4, tarsi 1.1.*

*Hab.* in Statu Antioquiensi reipubl. Columbianæ.

*Mus.* P. L. S.

This fine large species at first sight resembles in plumage *Thripadectes flammulatus*, but has not the peculiarly formed bill of that species, and belongs to the true *Automoli*, being nearest perhaps to the newly described *A. striaticeps* (P. Z. S. 1875, p. 37).

6. Report on the Indian Elephant which died in the Gardens on July 7th, 1875. By A. H. GARROD, M.A., Prosector to the Society.

[Received July 15, 1875.]

On May 1st, 1851, the Society purchased of Mr. Batty (then of the Circus, Westminster Bridge), for £800, an adult female *Elephas indicus* with its female calf. The specimens had been deposited in the Society's Gardens on the 19th of the preceding month. In the spring of the year 1850, John Stimpson, now keeper in the Society's service, left the E.I. Company's military service, and when at Cawnpoor, on his way to Calcutta, met an animal-dealer, Mr. Wallace, who was on his way to Calcutta with the female and calf in question as well as another Elephant. Stimpson is sure that the calf was born after the female had been captured, and thinks that it was three months old when he first saw it. He assisted in taking charge of the animals till they arrived in this country: they were five months on the voyage.

Of the two specimens purchased by the Society the mother was sold on April 28th, 1854, to the Zoological Society of Brussels, the calf continuing to suckle until that date, *i. e.* until upwards of four years of age.

It is this calf of 1851 which died on July 7th, 1875 (25 years old). The Superintendent, the head keeper, and the Elephant-keepers are of opinion that it continued to grow until within a year of its death. Its height at the withers at the time of its death was just eight feet.

For the last four years at least the animal has lost the power of extending its trunk, from paralysis of the anterior intrinsic muscles of that organ. It has thus not been able to throw its trunk over its

head, or even the least forwards. When it took food it flexed the trunk so as to present the orifice forwards. This symptom is one of decay.

For the last two years of its life it exhibited marked signs of rheumatism, varying in severity, very considerable at times. This was most manifest on its kneeling down to be saddled.

The animal during the last three years of its life looked preternaturally aged, and worn out. It has never suffered the least from cough, and has not become strikingly thin. It carried its saddle and visitors 36 hours before its death, apparently without discomfort, and ate well on the evening of the 6th inst.

For about six months the animal did not, as it was formerly wont to do, lie down at night. On the night of the 6th of July it fell on its left side, and did not subsequently make any powerful attempt to rise. The breathing was, when down, unusually rapid (about 25 a minute); and no marked symptoms of pain manifested themselves, general discomfort being evident. It died during the night of the 7th, having at 8:30 P.M. had a large dose (over 100 grs.) of strychnia given it by the mouth. Whether the poison was the cause of death is uncertain.

With the exception of one of the lungs, all the organs, the brain included, were perfectly healthy. The lung in question was almost entirely infiltrated with tubercular deposit, not more than one sixth being competent for the respiratory function. The tubercular infiltration was uniform or nearly so, being of a lighter colour and nearly in a condition to break up in the centre of the organ, forming a dark grey solid mass in the more recently affected portions near the margins.

It may be mentioned that the teeth just coming into wear had, in both jaws, 23, 24, or 25 plates; they were therefore the sixth molars. The epiphyses of the long bones were firmly united.

No entozoa were found.

As to the duration of the disease it is not easy to decide. It, no doubt, was of considerable standing; probably it had commenced with the first signs of decrepitude, about three years ago.

As to the cause of the tuberculosis, that was probably connected with the animal having been born and bred in captivity in a cold climate. A wild-caught animal 4 or 5 years of age would probably have thriven better.

## 7. On the Habits of the Fishes of the Genus *Antennarius*.

By the Rev. S. J. WHITMEE, of Samoa, C.M.Z.S.

[Received August 24, 1875.]

A few days ago a native brought me a living *Antennarius* which I at first thought was an undescribed species. Dr. Günther says of this genus, "there is scarcely another genus of fishes which offers so much difficulty in the discrimination of the species"\*. He has

\* Cat. of Fishes in British Museum, vol. iii. p. 184.

kindly determined the present individual, which I have sent to the British Museum, as *A. coccineus* (Less.).

The fish is found sticking to corals and stones on the reefs of Upolu, and is very difficult to distinguish from the coral or stone. Its Samoan name is *La'otali*.

As this fish was brought to me alive, I kept it in an aquarium in my study for a few days to observe its habits. It was brought in a cocoa-nut shell with very little water; and its stomach was greatly distended with air. When put into the aquarium it was some minutes before it could sink. It struggled hard to get down, and as the air was discharged it went down, and immediately attached itself, in a vertical position, to a block of coral by means of its pectoral and ventral fins. These were distended, and looked very much as if they served the purpose of sucking-disks (like the united ventrals in some of the *Gobiidae*) as well as answering in place of *feet*. When attached it held on very firmly, and I had a difficulty in disengaging it. Natives have told me that they have taken up a block of coral with this fish attached, and have had great difficulty in shaking it off.

After being in the water a few minutes my fish moved from its first position and, apparently, sought one better adapted to its habits. It cut a poor figure when attempting to swim, and prepared to *walk* where it could. It again fixed itself, in a vertical position with the head up, in an indentation in a coral block which pretty well matched its size. When attached it looked much like the block itself, the cutaneous tentacles and ocellated spots greatly resembling the fine seaweed and coloured nullipores with which the dead portions of corals and stones are more or less coated in these seas. As I watched it I could not help thinking that this fish presents us with what we now call (since Mr. Bates introduced the term) "mimicry." Being a slow swimmer and carnivorous, it has to get its food by stratagem. Hence the advantage of those characteristics which make it so grotesque in appearance—wide vertical mouth, rough and spotted skin with cutaneous tentacles, and the anterior dorsal spine modified into a soft tentacle.

I had positive evidence that the example in question was carnivorous. A short time after it had been put into the aquarium it vomited a slightly decomposed fish 1 inch 5 lines in length. This was one of the small fishes always seen in great abundance about the coral patches, nibbling at the fine seaweeds and the growing points of the corals. The capture of such fishes when unconsciously approaching it would, I believe, be greatly facilitated by the strong current produced when this *Antennarius* sucks the water into its capacious jaws. From its vertical position when fixed on a stone, the jaws open horizontally; and they are very wide. When examining the fish I placed it in a basin with about a pint of water. So much water was drawn into its jaws and expelled with such force through the foramina, which are directed backwards behind the pectorals, that a rapid rotatory motion was produced in all the water. This, I imagine, would be sufficient to engulf many a small fish or crustacean within its stomach.

The natives frequently get "stung" by the third dorsal spine of this fish, when they happen to pick up a block to which it is attached, before they are aware of its presence. It causes very great agony, which usually lasts several hours, and sometimes two or three days. Another fish, which I believe is also an *Antennarius*, but which I have not yet examined, produces effects much more alarming than this one. I have seen the hands and feet of natives swollen and greatly inflamed by a prick from the larger species, and have seen strong men weeping and groaning like children with the agony it caused. Sometimes the effect produced by a prick from this lasts for weeks.

Two or three weeks after procuring the fish described above, another living *Antennarius* was brought to me by one of my collectors. This, which has been likewise sent to the British Museum, is, as I am told by Dr. Günther, *A. multiocellatus* (Cuv. et Val.).

I had this example alive in my aquarium for several days. It was brought to me out of the water, and had been out several minutes. It seemed somewhat exhausted, but soon recovered when placed in the water. It affected a singular position. It moved occasionally from one place to another, and evidently preferred a position between two coral blocks near together. Here it planted its ventrals firmly on the sand at the bottom of the aquarium, while it fixed its pectorals, in the manner of disks, on the sides of the blocks of coral between which it was stationed, and raised its posterior extremity at an angle not far from the vertical. In this position it reminded me of the antics of "city Arabs" who walk on their hands with their legs in the air; its posture was almost exactly that assumed in such an exercise. The caudal fin was bent over towards the dorsal and in a line with it, while the anal was brought almost into line with the major axis of the body, occupying the position belonging to the caudal. Whenever it fixed itself for any length of time, it was always in this position; and in that attitude it *angled* with the ciliated anterior dorsal for some of the small fish in the aquarium. I hoped to see it catch one; but they were too wary. There were seven fish not too large for the *Antennarii*; but they had been some months in captivity, were quite at home in every nook and corner, and knew too well the nature of the new inmate to allow themselves to be taken off their guard. I am accustomed to feed these with bread-crumbs, and I tried to entice them to the neighbourhood of the *Antennarius* by dropping some so as to fall immediately in front of it. But it was to no purpose; they kept at a safe distance. When one ventured to dash at a falling crumb rather nearer than usual, it immediately darted away again in evident fear.

The way in which these little creatures showed their anger at the intruder amused me. They never approached it from the front, but always behind, and invariably *backwards*. As the *Antennarius* was protected behind by the coral blocks they had to approach it through the interstices of the coral; and only small fish could do this. When sufficiently near to suppose they could annoy their enemy, by a rapid motion of the caudal fin they lashed the water and then

darted away. But I never saw one actually strike the *Antennarius*.

This mode of attack, no doubt, explains why this fish chooses such a position as that observed by my example. Being very slow in its movements, it protects its posterior parts. Did it not do this it might be seriously injured by an *Acanthurus*. I have frequently observed my fishes fight by approaching backwards and lashing at each other with the tail. This will doubtless furnish a good reason for the formidable lateral armature of the tail in the Acronuridæ and some other families of fishes.

### 8. A Monograph of the Genus *Taphozous*, Geoff.

By G. E. DOBSON, M.A., M.B., F.L.S., &c.

[Received September 1, 1875.]

In 1872 I published some notes on the Asiatic species of *Taphozous*, giving a short synopsis of the species, in which they were divided into two groups. Since that time I have examined the types and large collections of specimens of the species of this genus in the British Museum, in the Museum of the East-India Company, in the Leyden, Berlin, and Paris Museums, also the collection in the Liverpool Museum and that of Sir Walter Elliot (most kindly forwarded from Scotland for my examination), as well as some private collections. Adding to these the large collection in the Indian Museum, Calcutta, I have thus examined a great number of specimens of the species of this genus, including the types, and am enabled to remove some nominal species from the list, to describe in detail, and to exhibit, in tabular form, according to their natural affinities, all the species of *Taphozous*.

#### TAPHOZOUS.

*Taphozous*, Geoffroy, Descript. de l'Égypte, ii. p. 126; Temminck, Monogr. Mammal. ii. p. 277 (excl. *Taphozous lepturus*, Geoff. et Temm.); Wagner, Suppl. Schreb. Säugeth. v. p. 684.

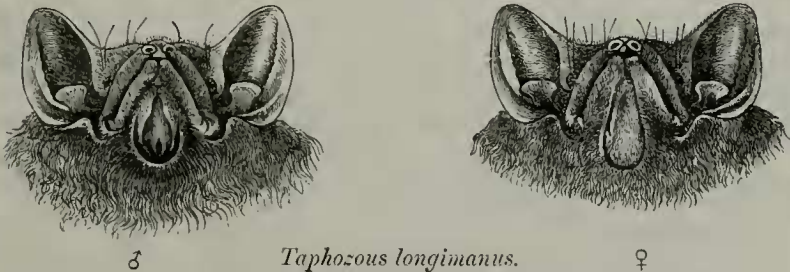
Muzzle very conical, broad behind, very narrow in front, terminated by the slightly projecting inner margins of the valvular nostrils. Crown of the head very slightly raised above the face-line: a deep frontal excavation between the eyes; ears separate, the inner margin of the conch arising by a short band from the side of the frontal concavity, the outer margin of the conch commencing in a small lobe close to the angle of the mouth but on a lower level; tragus short, narrowest opposite the base of its inner margin, expanded above; lower lip as long or slightly longer than the upper lip, terminating in front in two small triangular naked spaces separated by a more or less deep groove; eyes rather large, a distinct horizontal groove on the face beneath; thumb with a small but very acute claw; first phalanx of middle finger folded (in repose) on dorsum of metacarpal bone; foot long and slender, the outer toe as long as the middle toe, the inner

toe shortest; tail perforating the interfemoral membrane and appearing on its upper surface, capable of being partially withdrawn.

*Dentition*.—Inc.  $\frac{1-1}{4}$ ; C.  $\frac{1-1}{1-1}$ ; Pm.  $\frac{2-2}{2-2}$ ; M.  $\frac{3-3}{3-3}$ .

Premaxillaries cartilaginous, supporting a pair of small weak incisors often absent in adult animals; canines rather close together, much curved forwards, separated from the second premolar by a wide space in which the first minute premolar scarcely appears above the level of the gum; second upper premolar exceeding the molar in vertical extent; last molar consisting of a narrow transverse bony lamina; mesopterygoid fossa very narrow, the pterygoid plates terminating in long hamular processes; immediately behind, the basisphenoid is deeply excavated on either side of a narrow longitudinal bony ridge which connects the roof of the mesopterygoid fossa with the basioccipital, the excavations forming corresponding elevations on the floor of the brain-case; postorbital processes very long, connected by ligament with the zygoma, and thus completely circumscribing the orbit.

Fig. 1.



Most of the species of this genus have a peculiar glandular sac (see fig. 1) placed between the angles of the lower jaw—a sexual character; for, while always more developed in males than in females, in some species while distinct in the male it is quite absent in the female. The width of the opening of the sac is nearly equal to half the distance between the angles of the jaw; and the direction of the opening is anterior. This open *gular sac* is quite absent in both sexes in *T. melanopogon*, but about its usual position the openings of small pores may be seen, the secretion exuding from which probably causes the hairs in this situation to grow very long, forming the black beard found in many male specimens of this species.

In the greater number of species, also, a small band of integument passes from the inferior surface of the forearm near its distal extremity to the proximal extremity of the fifth metacarpal bone, forming a small pouch with the wing-membrane—the *radio-metacarpal pouch*.

This genus is limited to the tropical and subtropical regions of the Eastern Hemisphere, in which it is widely distributed. The distribution of the species is shown as follows:—

Africa and its islands . . . . .	3
North-eastern Africa and South-western Asia . .	1
Asia and Malayana . . . . .	5
Australia and New Guinea . . . . .	1

*Synopsis of Subgenera and Species.*

- I. Radio-metacarpal pouch distinct; lower lip scarcely grooved ..... Subgenus *Taphozous*.
- a. Radio-metacarpal pouch well developed.
- a'. No gular sac in male or female.
- a". Fur of the back extending upon part of the wing- and interfemoral membranes; extremity of tail thickened ..... 1. *T. melanopogon*, Temm.
- b". Fur of the back very narrow across loins, not extending upon the membranes; extremity of tail not thickened ..... 2. *T. theobaldi*, Dobson.
- b'. Gular sac present in males, rudimentary or absent in females.
- c". Gular sac quite absent in females, throat hairy beneath.
- a"". Ears as long or longer than the head... 3. *T. australis*, Gould.
- b"". Ears shorter than the head ..... 4. *T. perforatus*, Geoff.
- d". Gular sac rudimentary in females, throat naked beneath.
- c"". Fur brown above and beneath ..... 5. *T. longimanus*, Hardw.
- d"". Fur brown above, and beneath neck; chest and abdomen pure white..... 6. *T. mauritanus*, Geoff.
- b. Radio-metacarpal pouch small; fur very short, not extending to membranes ..... 7. *T. nudiventris*, Rüpp.
- II. No radio-metacarpal pouch; lower lip divided in the centre of its upper surface, and in front by a deep narrow groove ..... Subgenus *Taphonycteris*.
- a. Ears broadly rounded off above; inner margin smooth, slightly convex above; forearm three inches or less.
- a'. Gular sac developed (but smaller) in female also; fur dark brown above and beneath... 8. *T. saccolæmus*, Temm.
- b'. Gular sac rudimentary in female, the margins alone developed; fur brown above, pure white beneath ..... 9. *T. affinis*, Dobson.
- b. Ears triangular, narrowly rounded off above; inner margin papillate; forearm three and a half inches at least..... 10. *T. peli*, Temm.
- I. *Radio-metacarpal pouch distinct; lower lip scarcely grooved.*

## Subgenus 1. TAPHOZOUS.

## 1. TAPHOZOUS MELANOPOGON.

*Taphozous melanopogon*, Temm. Monog. Mammal. ii. p. 287; Wagner, Suppl. Schreb. Säugeth. v. p. 687; Cantor, Journ. Asiat. Soc. Beng. xv. p. 180; Dobson, Proc. Asiat. Soc. Beng. Aug. 1872, p. 153.

*Taphozous philippinensis*, Waterhouse, P. Z. S. 1845, p. 9.

No gular pouch; the openings of small pores appearing beneath the fur covering the inferior surface of the lower jaw between its angles; in some male specimens the hair in this situation is very long, forming a dense black beard. Radio-metacarpal pouch large.

Wings from the tibiæ above the ankles.

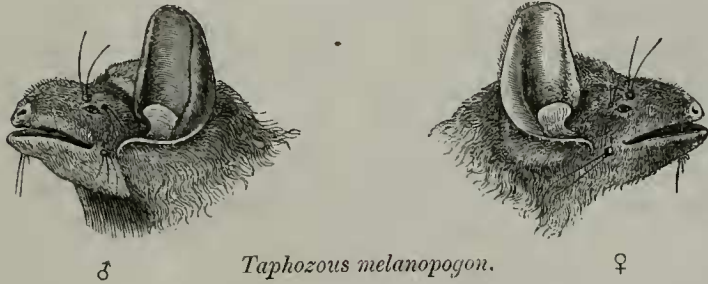
The fur of the head extends upon the face as far as a line joining the inner corners of the eyes; the inner side of the ear-conch is



covered with a few hairs; posteriorly the ears are clothed at their bases, naked above except where a row of fine hairs fringe the outer margin.

On the upper surface the fur of the body extends upon the wing-membrane about one third the length of the humerus and femur,

Fig. 2.



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*Taphozous melanopogon.*

♀

the remainder of the wing- and antebrachial membranes are quite naked; posteriorly the interfemoral is covered thinly almost as far as the point where the tail perforates it; inferiorly, the fur of the body extends outwards upon the wing-membrane as far as a line joining the middle of the humerus and femur; beyond this, as in other species, a band of very short fine hair extends along the posterior margin of the forearm to the carpus; the feet are naked, except where a few hairs arise at the base of the claws on the backs of the terminal phalanges of the toes.

Above, the fur is white at the base, then dark-brown, the extreme tips slightly grayish; beneath, white at the base, then paler brown than on the upper surface, the extreme tips grayish. In some specimens the white at the base of the hairs beneath is not well marked.

The black beard is not always developed in the males; its development seems to depend on certain conditions as yet not known; probably it appears periodically during the rutting-season. In five male specimens in the Indian Museum this beard is well developed, while out of over one hundred specimens received by M. Milne-Edwards from Cochin China, examined by me in the Paris Museum, two only possessed the beard.

The females of this species (in which neither the black beard nor pore-openings are developed) resemble those of *T. longimanus*; they are readily distinguished, however, by the absence of the rudimentary gular sac, and by the under surface of the lower jaw being well clothed with hair, by the larger ears, and especially by the tail, which is thickened and somewhat laterally compressed towards the tip, though in every other species of the genus it tapers slightly towards its extremity.

Length: head and body 3''·1; tail 1''·0; ear 0''·85, tragus 0''·23; forearm 2''·5; thumb 0''·35; second finger—metacarp. 2''·2, 1st ph.

0''·8, 2nd ph. 0''·9; fourth finger 2''·1; tibia 0''·9; foot and claws 0''·5.

*Hab.* Bengal (Jashpur), Pinang, Burma, Cochin China, Java.

Type in the collection of the Leyden Museum.

## 2. TAPHOZOUS THEOBALDI.

*Taphozous theobaldi*, Dobson, Proc. Asiat. Soc. Beng. Aug. 1872, p. 152.

Gular sac absent in both sexes. Inner margin of the ear papillate; ears larger than in any of the species of *Taphozous*. Radio-metacarpal pouch well developed, larger than in *T. melanopogon*. Wings from the tibiæ above the ankles.

The fur of the head extends upon the face as far as a line drawn between the inner corners of the eyes, the remainder of the muzzle is nearly naked; ear-conch naked, except where a few hairs clothe the basal portion of its inner surface; posteriorly the ears are naked except at the base and along their outer margins.

On the upper surface the wing- and interfemoral membranes are quite naked, the fur being strictly limited to the body; laterally the limit of the fur upon the back is defined by a well-marked line, convex *inwards* in the lumbar region; in *T. saccolæmus* and in *T. nudiventris* the line of fur is convex *outwards* in the same situation; so that in this species the space occupied by fur in the lumbar region is narrower than in any of the other species, and appears to depend on the position of attachment of the wing-membrane. The tail has but three or four long, very fine hairs.

Inferiorly, the chin is naked as far as the anterior prolongation of the external margin of the ears; the fur of the body extends upon the wing-membrane as far as a line joining the middle of the humerus and femur; from this a band of fine hairs extends outwards to the carpus; the interfemoral membrane is naked; the backs of the toes are covered with very short hairs.

Upper incisors very short and blunt.

Length: head and body 3''·35; tail 1''·35; head 1''·15; ear (anteriorly) 1''·1, tragus 0''·28; forearm 3''·0; thumb 0''·45; second finger 4''·7; fourth finger 2''·5; tibia 1''·15; calcaneum 0''·9; foot and claws 0''·65.

*Hab.* Tenasserim Province.

Type in the collection of the Indian Museum, Calcutta.

## 3. TAPHOZOUS AUSTRALIS.

*Taphozous australis*, Gould, Mammals of Australia; Wagner, Suppl. Schreb. Säugeth. v. p. 690.

A distinct but rather small throat-sac in males, in females quite absent, the chin being covered with hairs in the position occupied by the throat-sac in the males. Ears large, as long as the head, inner margin of the ear-conch papillate; no lobule at the base of the tragus. Radio-metacarpal pouch well developed.

Wings from the ankles or tarsus. Tail slender.

The face is everywhere covered with hair, which in front of the frontal depression is very short. The fur of the back extends for a short distance upon the wing-membrane, and upon the interfemoral as far as the point perforated by the tail; the remaining part has a few short hairs. Beneath, the wing-membrane is densely covered as far as a line drawn from the middle of the humerus to the knee, the limit of the fur being strictly defined as in *T. melanopogon*. As in other species, a baud of fur passes outwards behind the forearm to the carpus.

Fur, above and beneath, white at the base, the remaining three fourths of the hairs above dark-brown, and terminal half beneath paler brown. The fur of the body rather long and dense.

Length: head and body 3''·0; tail 1''·3; ear 0''·95, tragus 0''·28; forearm 2''·7; thumb 0''·4; second finger—metacarp. 2''·5, 1st ph. 8'', 2nd ph. 1''·1; fourth finger 2''·45; tibia 1''·05; calcaneum 0''·8; foot and claws 0''·45.

*Hab.* Australia, New Guinea.

Type in the collection of the British Museum.

### 3 a. TAPHOZOUS AUSTRALIS, var. FLAVIVENTRIS.

*Taphozous flaviventris* (Gould), Peters, P. Z. S. 1866, p. 430.

This appears to be a variety only of *T. australis*, differing in its greater size. Prof. Peters remarks:—"This species, represented by a single male submitted to my examination by Mr. Gould, is, although nearly related to *T. australis*, Gould, different in colour and in its superior size."

### 4. TAPHOZOUS PERFORATUS.

*Taphozous perforatus*, Geoffroy, Descript. de l'Egypte, ii. p. 126; Temm. Monog. Mamm. ii. p. 281; Wagner, Suppl. Schreb. Säugeth. v. p. 684.

Gular sac in males large, in females quite absent, chin hairy beneath; ears shorter than the head, inner margin faintly papillate. Radio-metacarpal pouch well developed.

Wings from the tibiæ, about a quarter of an inch above the ankles. Extremity of tail attenuated.

Fur short, dark-brown above and beneath, extending on both surfaces of the wing-membrane from the middle of the humerus to the middle of the femur, on the interfemoral membrane as far as the point perforated by the tail.

Length: head and body 2''·95; tail 0''·95; ear 0''·7, tragus 0''·23; forearm 2''·4; thumb 0''·35; second finger—metacarp. 2''·2, 1st ph. 0''·7, 2nd ph. 0''·9; fourth finger 2''·0; tibia 0''·9; foot and claws 0''·45.

*Hab.* Egypt.

Type in the collection of the Paris Museum.

### 5. TAPHOZOUS LONGIMANUS.

*Taphozous longimanus*, Hardwicke, Linn. Trans. xiv. p. 525;

Temm. Monog. Mammal. ii. p. 289; Blyth, Journ. Asiat. Soc. Beng. x. p. 974; Kelaart, Prodr. Faunæ Zeylanicæ, p. 12; Wagner, Suppl. Schreb. Säugeth. v. p. 688; Horsfield, Catal. Mammal. Mus. E. I. Comp. p. 41; Dobson, Proc. Asiat. Soc. Beng. Aug. 1872, p. 153.

*Taphozous bicolor*, Temm. *l. c.* p. 290.

*Taphozous fulvidus* et *brevicaudus*, Blyth, Journ. Asiat. Soc. Beng. x. p. 975.

*Taphozous cantori*, *id.* xi. 784.

The gular sac is large and well-developed, though not so large as in *T. saccolæmus*; in the female it is represented by a rudimentary fold of skin and nakedness of the integument in the same situation. Radio-metacarpal pouch moderately developed. Inner margin of ear smooth, not papillate; ears about same size as in *T. saccolæmus*. Wings from the ankles.

The fur of the head extends upon the face slightly in front of the eyes; the muzzle is almost quite naked; the inner side of the ear-conch is rather thickly covered with moderately long, fine hair; posteriorly the ear is almost naked, but a few fine hairs are ranged along the outer margin; the tragus is quite naked. On the upper surface the fur of the body extends upon the wing-membrane as far as a line joining the middle of the humerus and femur; posteriorly the interfemoral membrane is covered as far as the point of exit of the tail, along which some long fine hairs extend; the remainder of the interfemoral membrane is clothed with very short, almost invisible fur, which extends along the tibiæ to the feet, becoming longer on the terminal phalanges of the toes.

Beneath, the fur in front of the gular pouch, under the chin, is very short, and the skin there almost naked; the antebrachial membrane is covered with longer fur than upon the upper surface; on the wing-membrane the fur of the body extends more densely and further outwards than on the upper surface, being limited by a line joining the distal and middle thirds of the humerus and femur, but a narrow band of hairs extends outwards to the carpus; posteriorly the interfemoral membrane is naked, except at the root of the tail.

Fur varying from reddish-brown to black, above and beneath, the bases of the hairs white.

Upper incisors small and very slender in some individuals, in the greater number of specimens absent.

Length: head and body 3''·1; tail 1''·15; head 0''·95; ear (anteriorly) 0''·8, tragus 0''·25; forearm 2''·45; thumb 0''·3; second finger 4''·2; fourth finger 2''·15; tibia 0''·95; calcaneum 0''·85; foot and claws 0''·45.

*Hab.* Indian peninsula, Ceylon, Burmah.

Abundant about Calcutta and in all the southern parts of the Indian peninsula; not yet recorded from Northern India, nor from the Himalaya.

The colour of the fur varies very much. Among a large collection of specimens taken at the same place, one may be found with reddish-brown fur, the others blacker. In all cases, however, the base of the fur is white, and the darker-coloured individuals are generally females.

This species very closely resembles *T. perforatus*, Geoff., and may yet be shown to be a variety only of that species. The number of specimens of both species in the Museums at present is not sufficient to decide the question.

Type in the collection of the British Museum.

#### 6. TAPHOZOUS MAURITIANUS.

*Taphozous mauritanus*, Geoffroy, Descript. de l'Égypte, ii. p. 127; Temm. Monogr. Mammal. ii. p. 291; Wagner, Suppl. Schreb. Säugeth. v. p. 685.

*Taphozous leucopterus*, Temm. l. c. p. 284.

Inner margin of the ear indistinctly papillate; tragus naked, with a distinct angular projection near the base of its outer margin. Gular sac distinct in males, rudimentary in females, the throat being naked only in the position of the sac. Radio-metacarpal pouch smaller than in *T. longimanus*. Wings from the ankles. Feet small.

On the upper surface the face in front of the eyes is covered with short hairs, and the fur of the back extends upon the interfemoral membrane slightly beyond the point of perforation by the tail; beneath, the distribution of fur upon the membrane is similar, but the interfemoral is very thinly covered.

Fur, above, from the base for three fourths its length light buffy-brown, then dark brown with grey extremities; beneath, similar on shoulders and sides of the thorax and neck behind the ears as far back as the origin of the antehumeral membrane, the neck behind the gular pouch and the remainder of the chest and abdomen pure white.

On the upper surface the wing-membrane as far outwards as a line drawn from the ankle to the elbow, and also the antehumeral and interfemoral membranes are brown, the remaining part of the wing-membrane white, except a small ill-defined patch of brown inside the first phalange of the longest finger; beneath, all the membranes are white.

Length (of an adult male): head and body 3''·1; tail 1''·0; ear (anteriorly) 0''·8, tragus 0''·25; forearm 2''·4; thumb 0''·3; second finger 4''·0; fourth finger 2''·2; tibia 0''·85; foot and claws 0''·45.

*Hab.* Africa (eastern and western coasts), Madagascar, Bourbon and Mauritius Islands. In Africa probably limited to the tropical and subtropical regions.

Type in the collection of the Paris Museum.

#### 7. TAPHOZOUS NUDIVENTRIS.

*Taphozous nudiventris*, Cretzschmar, in Rüpp. Atlas Reise nördl. Afrika, Säugeth. p. 70, fig. 27*b* (1826); Temminck, Monogr. Mammal. ii. p. 280; Wagner, Suppl. Schreb. Säugeth. v. p. 684.

Inner margin of ears papillate in upper third: muzzle naked, very pointed; a small but distinct throat-sac in the male, in the female rudimentary, represented by a slight fold of skin and nakedness of the integument. Radio-metacarpal pouch very small. Wings

from the tibiæ. Backs of toes with long hairs almost as long as in the species of *Molossi*. Fur covering the body very short, white at the base, the extremities dark-brown.

In front the fur of the head does not extend beyond the frontal depression, and the muzzle is nearly naked; the ear-conch has a few fine hairs on its inner side only, tragus naked. The fur of the back is limited laterally and posteriorly by a well-defined line beyond which the finest hair does not pass; it does not extend upon the wing or interfemoral membranes, and the humerus, forearm, and antebrachial membranes are quite naked; posteriorly the terminal line of hair is separated from the point of exit of the tail by a considerable distance; beneath, the throat is nearly naked; the wing-membrane is covered as far as a line drawn from the middle of the humerus towards the pubis, and a band of fine hairs extends outwards posterior to the forearm to the carpus; the lower part of the abdomen, the legs, and the interfemoral membrane are quite naked.

In this species large collections of fat surrounding the root of the tail and extending between the thighs are found in many specimens, especially in those taken during the hibernating season. This appears to be a provision for sustaining life during the cold season, and would seem to indicate that this is the most northerly species of the genus; for I have not observed similar deposits of fat in the body of any of the other species, which all inhabit tropical or subtropical regions. Similarly large deposits of fat are found in *Rhinopoma* alone, which inhabits the same countries with this Bat.

Length (of an adult ♀): head and body 3''·7; tail 1''·6; ear 0''·85, tragus 0''·25; forearm 2''·95; thumb 0''·45; second finger—metacarp. 2''·55, 1st ph. 1''·1, 2nd ph. 1''·2; fourth finger 2''·8; tibia 1''·2; foot and claws 0''·6.

*Hab.* North-Eastern Africa (Egypt, Nubia); Asia Minor (Palestine).

Type in the collection of the Frankfort Museum.

#### 7a. TAPHOZOUS NUDIVENTRIS, subsp. KACHHENSIS.

*Taphozous kachhensis*, Dobson, Journ. Asist. Soc. Beng. 1872, p. 221.

Very similar to *T. nudiventris* in general form and in the distribution of the fur, but distinguished by the absence of the gular sac in both male and female; in the male the usual position of the sac is indicated by a small semicircular fold of skin and nakedness of the integument; in the female the surface is smooth. The measurements are also slightly different; but the general resemblance to *T. nudiventris* is so close that I hesitate to class it as a distinct species.

Length (of an adult ♀): head and body 3''·6; tail 1''·25; ear 0''·9, tragus 0''·25; forearm 2''·95; thumb 0''·45; second finger—metacarp. 2''·7, 1st ph. 1''·1, 2nd ph. 1''·3; fourth finger 2''·7; tibia 1''·1; foot and claws 0''·65.

*Hab.* Kachh, N. W. India.

Type in the collection of the Indian Museum, Calcutta.

II. *No radio-metacarpal pouch; lower lip divided in the centre of its upper surface, and in front by a deep narrow groove.*

Subgenus 2. TAPHONYCTERIS.

8. TAPHOZOUS SACCOLÆMUS.

*Taphozous saccolaimus*, Temminck, Monogr. Mammal. ii. p. 285. pl. 60.

*Taphozous crassus*, Blyth, Journ. As. Soc. Beng. xiii. p. 491.

*Taphozous pulcher*, Elliot, l.c. p. 492.

Ears shorter than the head; tragus concave on outer surface, upper margin regularly convex, margined posteriorly by a fringe of fine hairs; inner margin of the ear-conch smooth, not papillate; gular sac well developed in both male and female, but much larger in the male; lower lip with a deep narrow groove in the centre of its upper surface and in front. No radio-metacarpal pouch. Wings from the ankles.

On the upper surface the fur of the body scarcely extends upon the wing-membrane, the line of attachment of which seems to limit its extent; posteriorly the fur terminates, as on the sides, in a well-defined line limited by the root of the tail; the interfemoral membrane and the legs are quite naked, the feet are also naked, thus differing from the greater number of, if not from all, the species of the genus. Beneath, the chin and sides of the gular sac are covered with very short hair, the thorax and abdomen with moderately long fur, as on the upper surface; the antebrachial membrane has a few fine hairs; and the wing-membrane is covered as far as a line joining the middle of the humerus and the femur, a line of fur passing outwards to the carpus and occupying a considerable triangular patch of membrane there between the forearm and fifth metacarpal bone.

Fur, above, white at the base, the greater part of the hairs dark-brown, the surface mottled with small irregular white patches; beneath, reddish brown.

Length: head and body 3".5; tail 1".3; ear 0".8, tragus 0".23; thumb 0".5; second finger—metacarp. 2".75, 1st ph. 1".15, 2nd ph. 1".2; fourth finger 2".65; tibia 1".2; foot and claws 0".65.

*Hab.* Lower Bengal (Sylhet); Burma; Malay peninsula; Sumatra; Java.

Type in the collection of the Leyden Museum.

9. TAPHOZOUS AFFINIS.

*Taphozous affinis*, Dobson, Ann. Mag. Nat. Hist. 1875, xvi. p. 232.

Ears shorter than the head; inner margin of the ear-conch not papillate, tragus rather short, almost quite circular above, outer surface concave. Lower lip with a deep narrow groove in the centre of its upper surface. Male with a large gular sac, as large as in *T. saccolæmus*, rudimentary in the female, the margins of the sac alone developed.

No radio-metacarpal pouch. Wings from the ankles; fur, above,

black, the bases of the hairs white; beneath wholly pure silky white as in *Vesperugo temminckii*. The integument of the back is white; the antebrachial and interfemoral membranes, and that portion of the wing-membranes between the forearm and third finger, white, while that portion of the wing-membrane between the third and first fingers is black mottled with white along the third finger; beneath, the wing-membrane is pure white from the sides of the body outwards as far as the third finger, beyond which it is coloured as the corresponding part above.

This species is closely allied to *T. saccolæmus*, resembling it in its general structure and in measurements. It is at once distinguished by the pure whiteness of the fur of the thorax and abdomen, and of the wing-membrane (the same in the four specimens preserved in spirit, from which the original description was made), which in *T. saccolæmus* is always some shade of brown. Structurally it is distinguished by the complete absence of a gular sac in the females; for in *T. saccolæmus* a sac exists in the females also, though much less developed than in the males. The margins of a gular sac are well defined in this species; but no cavity exists.

Length: head and body 3''·4; tail 1''·1; ear 0''·9, tragus 0''·25; forearm 2''·9; thumb 0''·5; second finger—metacarp. 2''·8, 1st ph. 1''·2, 2nd ph. 1''·2; fourth finger 2''·5; tibia 1''·0; foot and claws 0''·6.

*Hab.* Labuan. Type in the collection of the British Museum.

#### 10. TAPHOZOUS PELI.

*Taphozous peli*, Temminck, Esq. Zool. sur la côte de Guinée, p. 82.

Ears proportionally smaller and more triangular than in the other species, upper half of the inner margin of the ear-conch papillate; tragus rather short, evenly rounded above as in *T. saccolæmus*. Lower lip with a deep narrow groove. Gular sac very large in males, rudimentary (the margins only defined) in females. No radio-metacarpal pouch.

Fur of the body short, not extending to the membranes; distribution similar to that of *T. nudiventris*.

Above, dark reddish-brown, beneath, a slightly paler shade of the same colour.

Length: head and body 4''·2; tail 1''·2; ear 1''·0, tragus 0''·3; forearm 3''·5; thumb 0''·6; second finger—metacarp. 3''·3, 1st ph. 1''·45, 2nd ph. 1''·45; fourth finger—metacarp. 2''·1, 1st ph. 0''·8, 2nd ph. 0''·45; tibia 1''·3; foot and claws 0''·8.

*Hab.* Africa, Gold Coast (Leyden Museum), Cameroon Mountains (Brit. Mus.), East Africa (Cambridge Mus.).

Type in the collection of the Leyden Museum.



9. Notes on the Fruit-pigeons of the Genus *Chrysaena*.

By OTTO FINSCH, C.M.Z.S.

[Received September 1, 1875.]

In looking over the last number of the Society's 'Proceedings' (January 1875), my attention was struck by a notice of Mr. Layard, P. Z. S. 1875, p. 30, relating to some birds of the Viti Islands, in which he says:—

"By the way, Professor von Suhm and I, after going carefully into the subject, came to the conclusion that the 'Orange Dove' of Taviuni and Lanthala (*Chrysaena victor*, Gould) is a phase of plumage of the 'Green Dove' (*Chr. luteovirens*)."

I regret that Mr. Layard did not tell us more particularly by what facts he became convinced of the identity of these species, as I, being well acquainted with them, do not understand how they can be considered to be phases of one and the same species. I have examined a good series of specimens of *Chrysaena luteovirens* collected by Dr. Gräffe at Viti Levu and Ovalau, and have seen all the changes of plumage from the uniform green dress of the first year (the so-called *Pt. feliciæ*, Hombr.) to the full-grown stage of the yellow plumage. This latter is, no doubt, that of the very old bird, which is likewise distinguished by a peculiarity in the structure of the feathers not to be found in any other member of the genus *Ptilonopus*. The small feathers, with exception of those of the head in *Chrysaena luteovirens*, are remarkable for their narrowed cylindrical form, reminding one in some respects of those in *Xipholena*. But this structure is not to be found in *Chrysaena victor* at all; so that if one were to take the structure of the feathers solely as a distinguishing generic character of *Chrysaena*, *C. victor* could not be placed in the genus. But, as I have shown already (P. Z. S. 1873, p. 733, foot-note), the genus *Chrysaena* differs from *Ptilonopus* chiefly in having no shortened and narrowly pointed first quill. In this character, as well as in the shortness of the wing, *C. victor* agrees very exactly with *C. luteovirens*; so that of their generic relationship there can be no doubt. But *C. victor* does not possess the peculiar feather-structure of *C. luteovirens*. Instead of the cylindrical structure of *C. luteovirens*, the feathers of *C. victor* are remarkable for the length and laxity of their rachis, which resemble those of the Parrot-genus *Coryllis* (*Loriculus*), so that the upper tail-coverts project a little over the tail-feathers. Now if *C. luteovirens* were only a phase of plumage of *C. victor*, this could be only in relation to age, and consequently *C. luteovirens* would have to be regarded as the younger bird. But the structure of its feathers shows a peculiarity which can only be attained in the fully adult bird; and there cannot be the slightest doubt that *C. luteovirens* would never lose this extraordinary character of feathers and again assume a structure of feathers which comes nearer to that of the young state. I need hardly remark that the coloration in the two species is totally different, being in *C. luteovirens*, in mature state, dark yellow, and in *C. victor* deep orange-

red, nearly the same as in *Rupicola crocea*; but I may remark that *C. victor* gets this splendid garb immediately after its first green dress, without going into an intermediate yellow dress, such as that of *C. luteovirens*. One of the specimens of *C. victor* which I have had the pleasure of examining showed the change of plumage very clearly, having on the sides of the belly and flanks still some grass-green feathers, the remnants of the first plumage. Another point of importance is also the range of both species. *C. luteovirens* has been found only on the islands of Viti-Levu and Ovalau, whereas *C. victor*, so far as our knowledge extends, is confined to the small islands of Taviumi and Lanthala, on the east coast of the large island Vanua-Levu. I believe the above-given remarks and comparisons between *C. luteovirens* and *C. victor* are sufficient to prove that they form excellent species, which ought not to be confounded in any way; at least Mr. Layard must give us far more exact and minute explanation in order to prove that his conclusions are right.

10. A Monograph of the Siliceo-fibrous Sponges. By J. S. BOWERBANK, LL.D., F.R.S., F.Z.S., &c.—Part V.

[Received September 17, 1875.]

(Plates LXI. & LXII.)

*FARREA SPINIFERA.* (Plate LXI. fig. 1.)

Sponge-form unknown. Dermal membrane unknown. External skeleton-surface (?) irregular; primary fibres branching and anastomosing, large and strong, armed irregularly with very large and strong, acutely conical spines; fibres and large spines mostly smooth, occasionally incipiently and minutely spinous; secondary fibres minutely spinous. Internal surface similar in character to the external one, but less strongly developed. Interstitial stratum—rete irregular, fibres more slender than those of the external surfaces, profusely minutely spinous, spines symmetrically disposed in about equidistant linear series in accordance with the long axis of the fibre. Sarcode dark amber brown.

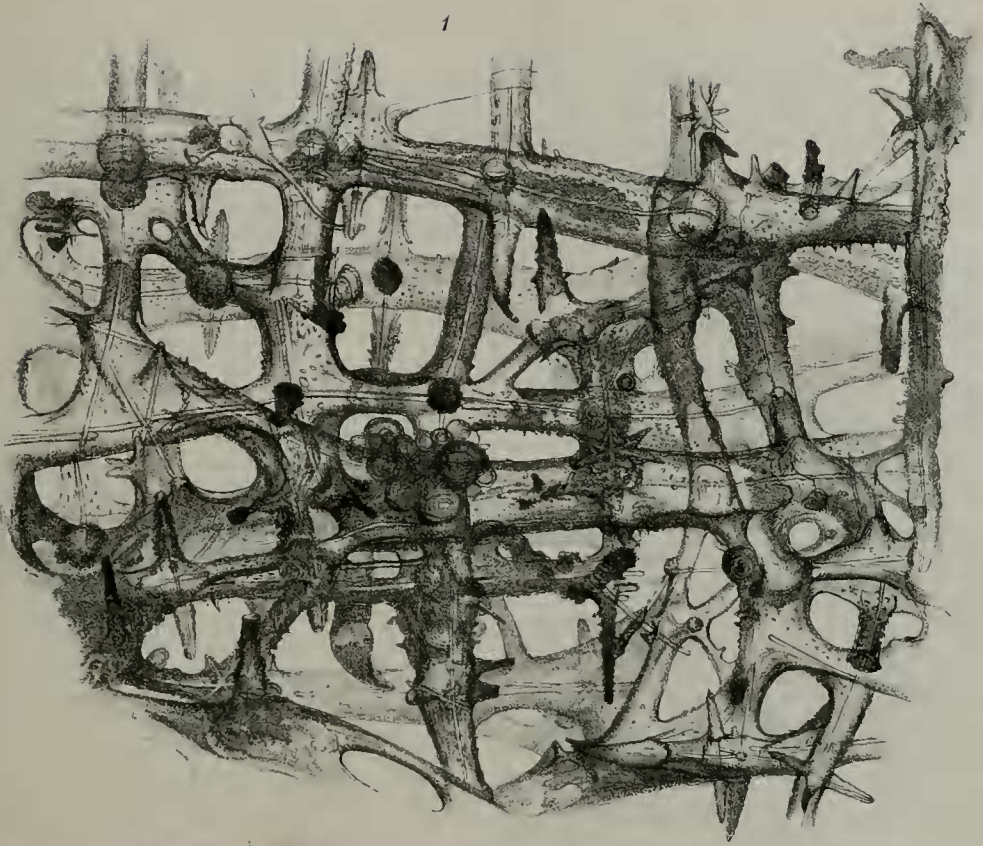
Colour, in the dried state, dark amber.

*Hab.* West Indies, Captain Hunter, R.N.?

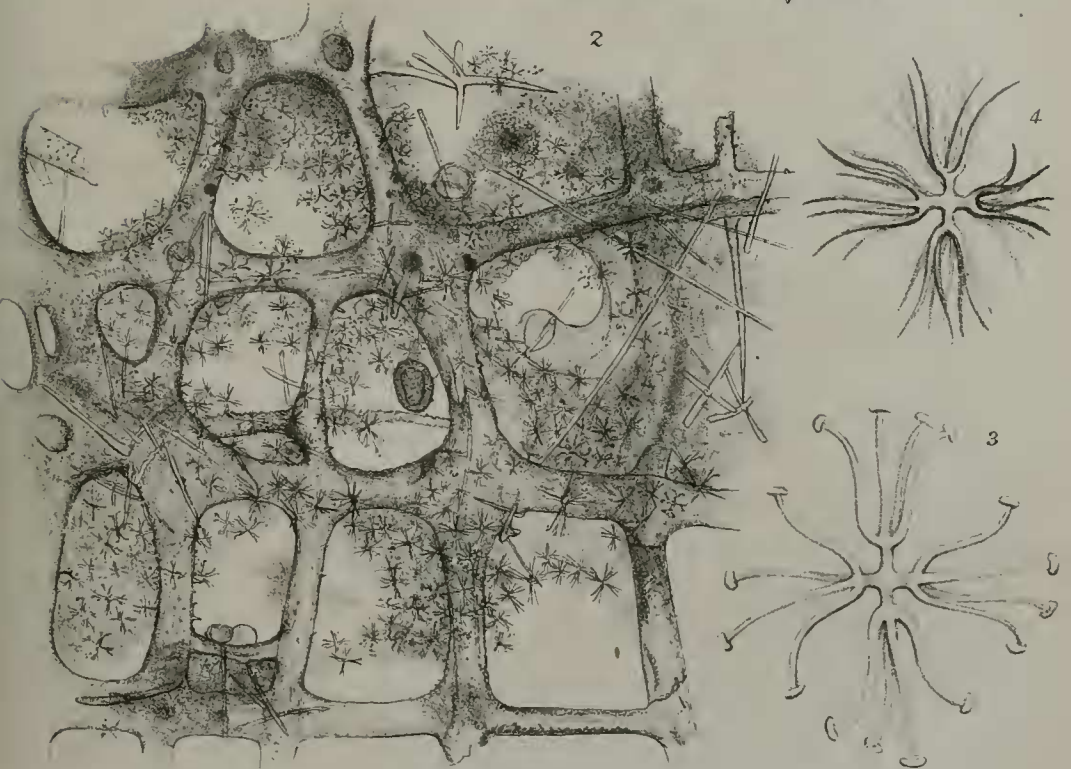
Examined in the dried state.

The specimen from which this species is characterized is a fragment seven lines in length, by four in greatest breadth; and it has every appearance of having been part of the side of a small cup-shaped Sponge. I have presumed that the surface having the stoutest fibres and the greatest amount of defensive armature is the external one. There are no indications of a symmetrical dermal rete, such as we find in some other species of *Farrea*; but the skeleton-fibres are quite in accordance with the structural peculiarities of those of many species of that genus, and I have therefore referred

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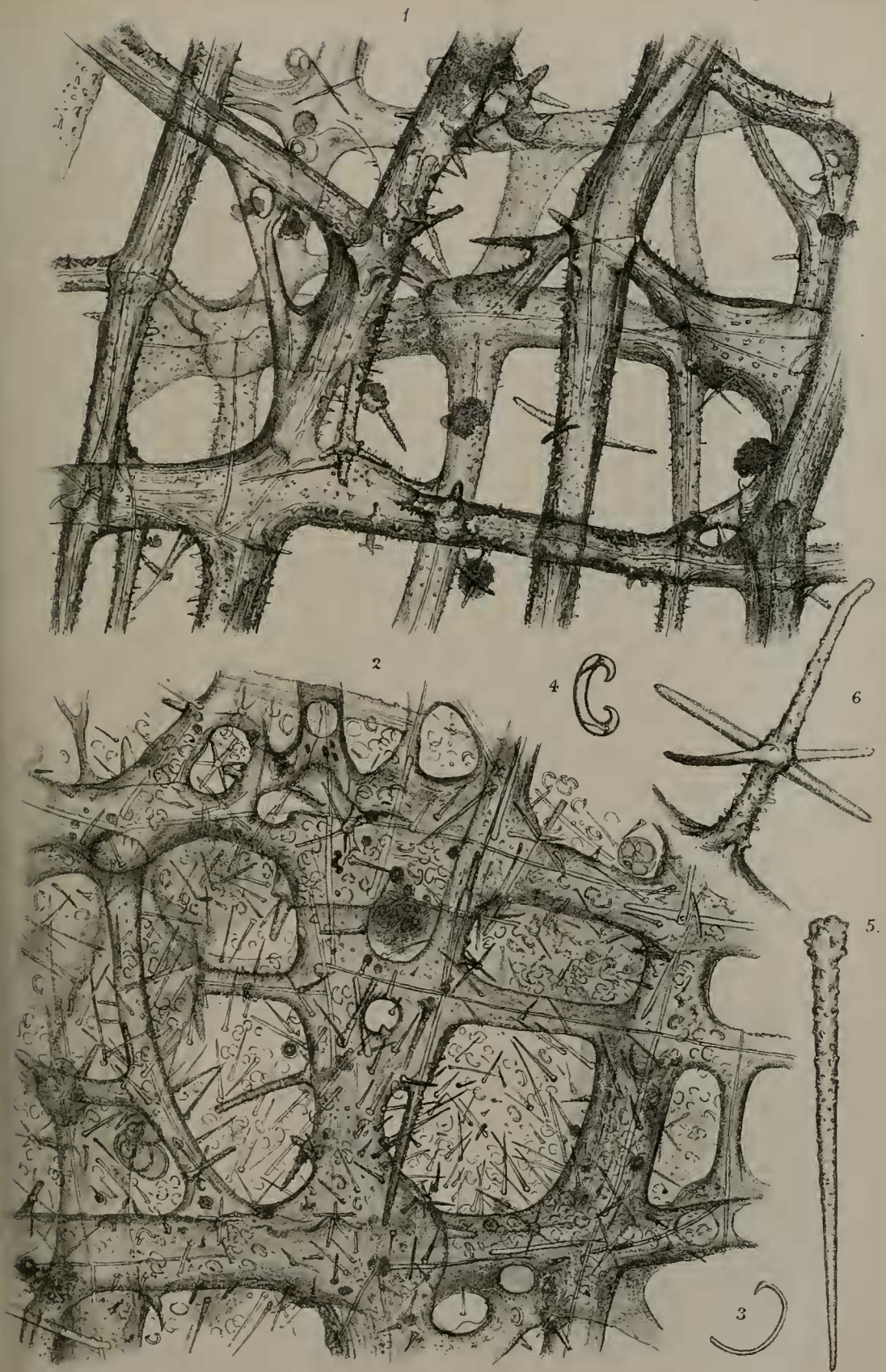


2



Farrea spinifera 1. F. spinulenta 2 - 3.  
Alcyoncellum speciosum 4.





*Farrea aculeata* 1. *F. robusta* 2-6



it to *Farrea* until further information on the subject enables us to assign it more correctly to its proper place among the siliceo-fibrous sponges.

The primary skeleton-fibres are large and cylindrical, but of unequal diameter, and mostly have the appearance of transparent longitudinal striation from their strongly marked lines of growth, and they are more or less minutely spinous; their course is irregular, not running in straight lines, but in meandering ones, branching at intervals and again anastomosing with each other. Their large conical defensive organs are not all systematically projected outwards at about right angles to the dermal surface; some are so disposed, while others have a lateral direction, or are projected at various intermediate angles.

The central system of canals in the primary fibres is subject to considerable irregularity. Sometimes they are regularly confluent; at others they are produced in opposite directions, and their distal ends pass each other, and each has a cæcoid termination. It is not an unusual circumstance to see a short sexradiate arrangement of canals within one of the large fibres, as if the process of the production of new branches was first, the development of the canals within the parent fibre, and then the projection of the young offshoots in accordance with the nascent canals. In some cases there is not the slightest indication on the surface of the large fibre of the coming offshoot, while in others there is a very slight elevation on its surface immediately above the nascent canal; or the young shoot, in the form of an acutely conical projection, is unmistakably present with the continuation of the canal in its centre to its apex, where it usually appears to be open in the early stage of its development, with extremely delicate margins; but in a more advanced stage of its growth the apex becomes solid. These projections of young branches are readily to be distinguished from the conical external defences by their canals, while the defensive organs appear to be perfectly solid.

The inner external surface has the same characters as the outer one, but the dermal skeleton-fibres seem to be rather more slender. The intervening skeleton is more regular in its construction than the external layers. The reticulation is more regularly quadrate and the areas smaller. The fibres are also smaller and more profusely spinous; and the central canals are more continuous and confluent than those of the fibres of the external surface, and in some parts they are densely coated with dark-coloured opaque sarcodæ. I could not detect the slightest traces of any detached spicula amidst the structures.

This interesting specimen is in the cabinet of my friend Mr. H. Deane, who, I believe, received it with other specimens from Captain Hunter, R.N.

Since the above description was written, I have received another specimen of this species from my friend Mr. Deane. It is about four lines square, and is closely attached by one of its broad surfaces to the side of a small fragment of a *Vermetus*, and does not exhibit

traces of any pedicel. In every anatomical character it is in close accordance with the type specimen. A portion of this specimen is quite obscured by a crowd of Foraminifera and Polycistina entangled in the areas of the skeleton-rete.

The decease of my friend Mr. Deane does not allow of my determining the locality of this species with certainty; but I am strongly of opinion that it was collected by Captain Hunter in the West Indies, along with *Farrea Gassioti* and other similar specimens.

FARREA SPINULENTA. (Plate LXI. figs. 2 & 3.)

Sponge-mass unknown. Dermis furnished with a quadrilateral siliceo-fibrous network, armed at the angles oppositely externally and internally with imbricated elongate-conical spicular defences. Fibre solid, without canals, minutely spinous; spines acutely conical, rather numerous, symmetrically disposed. Dermal membrane thin, translucent, abundantly furnished with spinulo-quadrifurcate sexradiate stellate retentive spicula dispersed. Interstitial spicula large, simple, rectangulate, sexradiate; radii acerate, more or less spinous. Sarcode light brown.

Colour, in the dried state, light brown.

*Hab.* Tripoli (*Captain C. Tyler*).

Examined in the dried state.

The portion of the sponge representing this very interesting species is not quite the eighth of an inch in diameter. It was presented to my friend Captain Charles Tyler by Mr. Deane. It was found off the coast of Tripoli. The specimen is but a minute portion of the dermis of a sponge the mass of which is unknown to us; but the nature of the structures displayed by its microscopical examination unmistakably indicates that it belongs to the genus *Farrea*. The quadrilateral siliceo-fibrous network of the dermal rete accords in form very closely with that of *Farrea occa*. The fibres in each species are solid; and, as in *F. occa*, the angles of the tissue, both externally and internally, are armed with imbricated conical spicular defences; but these organs are longer and more slender in their proportions than in those of *F. occa*.

Thus far they agree very closely in their structures. They differ from each other in other important characters. The fibres in *F. occa* are quite smooth, while those in the species under consideration are regularly and systematically spinous, forming a very important specific character. These spines are not irregularly dispersed; they are disposed in equidistant parallel lines, in accordance with the long axis of the fibre, the spines in each line being also at about equal distances from each other and opposite the middle of the intervening spaces of those in the lines on each side of them, so that their mode of disposition on the fibre is remarkably symmetrical and very characteristic. Other essential differences occur in the dermal membranes of the two species. In the quadrilateral, smooth, siliceo-fibrous network of the dermis of *F. occa*, described in the Proceedings of the Zoological Society of London for March 13, 1869,



p. 339, plate xxiv. fig. 7, there are some very small portions of the dermal membrane on parts not represented in the figure *in situ* on some of the angles of the rete, in which there were fragments of extraneous spicula of various forms embedded in the sarcode; but I could not detect any form among them that could be assigned with any degree of probability as belonging to that dermal membrane, while in that of that of the species under description the dermal membrane abounded with them. The form of these spinulo-quadrifurcate sexradiate stellate spicula is slender and very beautiful; and they are so numerous in some parts of the tissue, and so closely packed together, that their forms are completely obscured; but in other parts, where a few only occur, they may be frequently seen in a very perfect condition. They are very minute: one of the largest that was measured did not exceed in its extreme diameter  $\frac{1}{429}$  inch; and the quadrifurcate terminal spicula measured  $\frac{1}{20000}$  inch in diameter.

The large, simple rectangulate sexradiate interstitial spicula with spinous radii, a few of which are entangled in the inner surface of the dermal rete, also form efficient specific characters, none such having hitherto been found in *Farrea occa*.

FARREA ACULEATA. (Plate LXII. fig. 1.)

Sponge—form, dermal membrane, oscula, and pores unknown. Skeleton—primary fibres cylindrical, stout, branching, and anastomosing, furnished profusely with acutely conical spines irregularly dispersed, and with numerous long, slender defensive prickles projected in various directions, covered with minute spines, and also with numerous rectangulate sexradiate defensive organs, radii slender, entirely spinous; canals very slender, confluent, frequently obsolete. Secondary fibres the same as the primary ones, short and less in diameter.

Colour, in the dried state, dark amber?

*Hab.* West Indies (*Captain Hunter, R.N.?*).

Examined in the skeleton state.

The specimen, a portion of which is represented by fig. 1, Plate LXII., is 10 lines long, by  $6\frac{1}{2}$  wide. It has apparently formed part of a rather large-sized cup sponge. From the flatness of the specimen and the uniformity of the two surfaces, it cannot be determined with certainty which of the two was the outer or inhalant one; but I am inclined to believe that the figure represents a part of the outer surface; nor can its locality be accurately determined. The specimen was presented to me by my late friend Mr. Henry Deane, with several other siliceo-fibrous ones, including those from the West Indies collected by Captain Hunter, R.N.; and I am strongly inclined to believe the locality to be the same as that of *Farrea Gassioti*, lat.  $14^{\circ} 8' N.$ , long.  $77^{\circ} 38' W.$ , West Indies, 800 to 1000 fathoms.

The reticular skeleton of this species is very regular, by far the greatest number of the areas being square, and the fibres in both directions being of about the same diameter. There appears gene-

rally to be two layers of skeleton-structure; and occasionally a portion of a third layer may be seen between them; and this intermediate one appears to be very much less regular in its structure than either of the other two. The acutely conical spines on the fibres are not equally dispersed; on some parts they are very numerous, while on others they are much less in number. The aculei are very characteristic organs. They are of unequal length, and irregular in their mode of disposition. On some fibres a single one is projected; on others there are two on opposite sides of the fibre; and sometimes there are three or four developed in directions opposite to each other. They are rather slender, and attenuate gradually from the base to the distal extremity, which is frequently very slender and acute. The rectangulate sexradiate defensive organs are numerous; they are of nearly equal size, and are disposed irregularly among the fibres; but they are mostly projected into the square areas of the skeleton-rete. The canals in the skeleton-fibres are very slender, and in many of the large ones they are partially or entirely obsolete.

I know of no other species for which *F. aculeata* might be readily mistaken except *F. spinifera*. The former species differs from the latter in the smallness and very much less-developed state of the canaliculation of its fibres, and in the far greater development of the minute spination of its skeleton—also in the abundance in the former species of the rectangulate sexradiate internal defences, while in the latter they appear to be totally absent.

**FARREA ROBUSTA.** (Plate LXII. figs. 2-6.)

Sponge—form cup-shaped? surface minutely hispid. Oscula and pores unknown. Dermal membrane thin and pellucid, abundantly spiculous; tension-spicula long and very slender, subclavate, cylindrical, very few in number; retentive spicula simple and contort, bihamate, small and slender, dispersed, rather numerous, and bidentate equianchorate small and few in number; furnished also with numerous internal defensive spicula of subspiculate, attenuato-acuate forms, entirely incipiently spinous, projected at various angles from the inner surface of the membrane.

Skeleton—fibres very large and strong, cylindrical, sparingly spinous or aculeated; aculei short and slender, dispersed; armed abundantly with rectangulate sexradiate defensive organs, radii slender, attenuated, incipiently spinous. Rete more or less quadrangular, areas frequently very little more in breadth than the diameters of the skeleton-fibres. Central canals small.

Colour, in the dried state, dark amber.

*Hab.* West Indies (*Captain Hunter, R.N.?*).

Examined in the skeleton state.

I have seen only a single specimen of this remarkable sponge. It was given, with other specimens, by the late Mr. Henry Deane to my friend Captain Charles Tyler, who kindly presented it to me for description and publication. It consists of a thin plate of siliceo-fibrous

structure of an irregular form, of an average diameter of half an inch. It is constructed of two, and in some parts of three, layers of rete, the intermediate layer, when present, having its fibres more slender and more irregularly disposed than the two external ones. The fibres of the outer structures are remarkably large and strong; an average-sized one measured  $\frac{1}{1.25}$  in. in diameter; and the rete is more than usually close and compact; in many cases the areas do not exceed in breadth the diameter of the surrounding fibres. The form of the rete is mostly either square or oblong; and its strength is greatly increased by the interior angles being replaced by curves, so that the areas are to a great extent either circular or oval. The external layer of tissue is sparingly spinous, and is also furnished with short and slender aculei, and abundantly with rectangulate sexradiate defensive organs, based most frequently on the sides of the fibres and projected thence into the areas of the network; and the aculei are apparently the nascent state of these organs.

There are strong appearances of the specimen having been part of a cup-shaped sponge; at one portion of it the skeleton-rete is closely and irregularly as it were crushed together; from this part the primary skeleton-fibres radiate in a fan-shaped mode, the secondary ones assume the state of a series of concentric curves, and the reticulation increases in regularity of structure as it approaches what has evidently been the distal portion of the cup-shaped structure; and here it is that we find the dermal membrane and its characteristic spicula in the finest state of preservation.

The dermal membrane is extremely pellucid, and would scarcely be visible if it were not for the numerous retentive spicula adherent to its surface.

The bihamate retentive spicula are numerous, uniform in size, and very slender; their curves are about three fourths of a circle; and they are equally dispersed over the surface of the membrane. They do not exceed  $\frac{1}{8.57}$  inch in length. The minute bidentate anchorate ones are very few in number; one of the largest of them measured  $\frac{1}{1000}$  inch in length: they vary in their mode of development to some extent; and occasionally there is a third, small tooth, more or less produced, between the two large lateral ones. The attenuato-subspinulate internal defensive spicula are also very numerous; they vary somewhat in size, and are entirely incipiently spinous; one of the largest measured  $\frac{1}{150}$  inch in length; they are based on the inner surface of the dermal membrane, and are projected inwards at various angles, while others are seated on the sides of the dermal skeleton-rete, and are projected into the areas at various angles. The whole three forms abound, not only on those parts of the membrane covering the areas of the reticulations of the fibres, but they also occur on the parts attached to the skeleton-fibres, so that no part of the dermal membrane is left unprotected.

The central canals of the skeleton-fibres are small; they vary to a slight extent in some parts of the rete, and in some of the largest of the fibres they are entirely obsolete.

The rectangulate sexradiate organs are not very numerous near

the external surface of the sponge, but they occur in considerable numbers on the more deeply situated portions of the skeleton-fibres, whence they are projected into the areas of the skeleton-rete. They vary considerably in the amount of their development: some are comparatively short, and have their lateral radii widely spread; and these are abundantly spinous; while others are taller and have slender and nearly smooth radii. The dimensions of one of the stouter forms was  $\frac{1}{200}$  inch high, with a lateral spread of  $\frac{1}{200}$  inch.

There is no species among those which are most nearly allied to the one in course of description with which it is likely to be confounded. The robust form of its skeleton, and the peculiarities of its membranes and its other organs strikingly distinguish the species.

The abundance and variety of the forms of defensive spicula in this sponge present a striking evidence of the futility of attempting to arrange the Spongiadæ by the forms of their auxiliary spicula, as it has been suggested by some imaginative naturalists. Systems founded on such bases look very learned and imposing upon paper, but when applied to the accurate discrimination of species they prove quite inadequate to their proposed purpose.

In such sponges as the one under consideration, which have exceedingly thin parietes, and but comparatively small portions of soft tissues, it becomes necessary that those vital parts should be taken especial care of; and hence the profusion and variety of these minute defensive spicula to protect the vital parts, otherwise so much exposed to the numerous minute predatory creatures that exist so abundantly around them; and hence it is that nature has in each case provided the defences most suitable to the various species, without reference to any particular type of sponges, and those only most appropriate to the purpose of the preservation of the membranous and sarcodous organs so essential to the individual's existence. In the species in course of description, we have not only the usual rectangulate sexradiate organs of defence common to so many siliceo-fibrous sponges, but we also have, in addition to them, those which are so frequently appropriated to *Halichondria* and many other genera differing widely in their structures from each other, to render the preservation of the delicate membranous organs of this species completely certain. In other species of siliceo-fibrous sponges of similarly delicate structure we have the floriform-sexradiate stellate forms, as in *Farrea spinulenta*, which are so plentiful in several species of *Geodia*, a genus differing widely in its structural peculiarities from *Farrea* and other kindred genera.

A slight doubt exists as to the true locality of this sponge, which the decease of my late friend Mr. Henry Deane does not allow us to clear up. When Captain Tyler received the specimen from Mr. Deane, he received others of a similar description from the coast of Tripoli; but he is strongly of opinion that this species was among those that were brought up on the cable by Captain Hunter in lat.  $14^{\circ} 8' N.$ , long.  $77^{\circ} 38' W.$  from 800 to 1000 fathoms depth.

## EXPLANATION OF THE PLATES.

## PLATE LXI.

- Fig. 1 represents a view of a portion of the external surface of the late Mr. Henry Deane's specimen of *Farrea spinifera*,  $\times 61$  linear.
- Fig. 2 represents a portion of the dermal surface of *Farrea spinulenta*, with its numerous quadrifurcate spinulo-sexradiate stellate retentive spicula,  $\times 80$  linear.
- Fig. 3. One of the quadrifurcate spinulo-sexradiate stellate spicula,  $\times 666$  linear.
- Fig. 4. A sexradiate stellate spiculum with attenuated radii, from *Alyoncellum speciosum*, to compare with those of *Farrea spinulenta*,  $\times 666$  linear.

## PLATE LXII.

- Fig. 1. A portion of the skeleton-rete of *Farrea aculeata*, exhibiting the general structure of the sponge and the characteristic mode of disposition of the aculei,  $\times 61$  linear.
- Fig. 2 represents a portion of the outer or inhalant surface of *Farrea robusta*, with the dermal membrane in a fine state of preservation, with its numerous retentive and defensive spicula *in situ*,  $\times 80$  linear.
- Fig. 3. One of the contort bihamate retentive spicula,  $\times 666$  linear.
- Fig. 4. One of the minute bidentate equianchorate retentive spicula,  $\times 666$  linear.
- Fig. 5. A fully developed subspinulate attenuato-acuate internal defensive spiculum, entirely but incipiently spinous,  $\times 666$  linear.
- Fig. 6. One of the rectangulate sexradiate internal defensive organs, entirely but incipiently spinous, based on a portion of the skeleton-fibre, and projected into one of the areas of the skeleton-rete,  $\times 666$ .

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November 16, 1875.

Dr. Günther, F.R.S., V.P., in the Chair.

The Secretary read the following report on the additions to the Society's Menagerie during the month of October 1875.

The total number of registered additions to the Society's Menagerie during the month of October was 73, of which 39 were by presentation, 16 by purchase, 2 by exchange, 5 by birth, and 11 were received on deposit. The total number of departures during the same period, by death and removals, was 130.

The most noticeable additions during the month of October were as follows:—

1. A Scolopaceous Courlan (*Aramus scolopaceus*) from South America, purchased 6th October, 1875. This bird was in a very weak condition when received, and did not live long, but is of interest as being the first example of this aberrant form yet received alive.

2. A Binturong, from Malacca, presented by Capt. A. R. Ord, October 19th. We have likewise now in the Gardens a Grey Binturong (*Arctictis albifrons*, F. Cuv.) from Borneo, presented by Sir Harry Ord in 1873; so that we may hope eventually to solve the question whether this and the Black Binturong (*A. binturong*) are really different species, as considered by F. Cuvier, or mere varieties.

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Mr. Sclater exhibited the upper horn of a two-horned Rhinoceros that had been shot in March last by Lieut.-Col. C. Napier Sturt, F.Z.S. in the valley of the Brahmapootra, about 40 or 50 miles north-east of Dohbree, when in company with Mr. Archibald Campbell, Deputy-Commissioner of Dohbree, and Mr. Williamson, Governor of the Towra Hills. The place where the Rhinoceros was found was near the gorge where the Sunkos river issues from the Bhotan range, and is actually within the old boundary of Bhotan.

Mr. Sclater remarked that this seemed to prove conclusively the existence of a two-horned species of Rhinoceros in Assam, which would probably turn out to be the same as that from Chittagong, now living in the Society's Gardens.

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Mr. Sclater read an extract of a letter addressed to him by M. le Dr. N. Funck, Director of the Zoological Garden, Cologne. Dr. Funck stated that the bird figured in Mr. Sclater's article on the Curassows, recently published in the Society's 'Transactions' (vol. ix. pl. 53) as *Pauxis galeata*, var. *rubra*, was the true female of *P. galeata*. Dr. Funck had traversed the district inhabited by this species from Puerto Cabello in Venezuela, to Valencia and Truxillo\*, and had killed upwards of 50 individuals; amongst these were many females, shot at the side of the males, coloured exactly as the above-mentioned figure.

Under these circumstances, Mr. Sclater was now inclined to believe that the case of the female resembling the male in plumage, of which two instances were given in the article above mentioned, was abnormal, corresponding to that known to occur occasionally in the females of other birds.

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Mr. Seebohm, F.Z.S., exhibited a series of rare and interesting birds and eggs from the tundras and deltas of the Petchora river, North-Eastern Russia, collected there by Mr. J. A. Harvie-Brown and himself during the present year. The following were the chief objects:—The eggs and young in down of the Grey Plover (*Squatarola helvetica*); the nest, eggs, and young in down of the Little Stint (*Tringa minuta*); the eggs of Bewick's Swan (*Cygnus bewickii*); skins, nest, and eggs of *Phylloscopus tristis* (new to the European fauna); skins, nest, and eggs of a new species of *Anthus*, which Mr. Dresser has named *A. seebohmi*, after its discoverer; skins, nest, and eggs of the Yellow-headed Wagtail (*Motacilla citreola*); skins of *Parus kamschatkensis*; skins of a Herring-Gull, differing specifically from *Larus argentatus* and *L. leucophæus*, and probably identical with *Larus cachinnans* of Pallas.

Eggs and down of ten species of Ducks, including the Smew (*Mergus albellas*), obtained in the valley of the Petchora were likewise exhibited.

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\* Dr. Funck states that *Pauxis galeata* is abundant in the forests from San Estevan (one league from Puerto Cabello) up to the Cumbre of Valencia, *i. e.* from 1000 to 3000 feet in altitude, and likewise in the mountains of Noigua and Montalban in the same province.





A.



C.



B.



G.H. Ford

Mintern Bros. engr.

A ANSONIA ORNATA. B POLYPEDATES BEDDOMII C IXALUS DIPLOSTICTUS







B.



C.



A.







B.



A.





B.



C.



A.



Mr. A. H. Garrod read a paper on the structure of the Manatee (*Manatus americanus*) lately living in the Society's Gardens. Mr. Garrod drew attention to a peculiarity in the mechanism of the upper lip, by which that structure is capable, through the combined transverse movements of the lateral pads which compose it, of employing the lips as an independent prehensile organ. The size of the blood-disks was also given, together with drawings of the external and internal conformation of the brain.

This paper will be printed in the Society's Transactions.

The following papers were read:—

1. Third Report on Collections of Indian Reptiles obtained by the British Museum. By Dr. ALBERT GÜNTHER, V.P.R.S., V.P.Z.S.

[Received October 19, 1875.]

(Plates LXIII.—LXVI.)

In my second Report (see above, p. 224) I have treated of Lizards and Snakes collected by Lieut.-Col. Beddome and the late Mr. Jerdon. The present paper is a continuation of the account of these collections, and treats of the Batrachians.

*RANA GRACILIS* (Wieg.).

I consider *Rana agricola* (Jerd.) and *Rana nilgirica* (Jerd.) varieties of this species, which is remarkable for the amount of variation in the length of the limbs and toes.

*RANA TIGRINA* (Daud.).

A specimen named by Mr. Jerdon, and representing his "*Rana crassa*" belongs to this species.

*RANA LIEBIGII* (Gthr.).

I regard *Rana sikkimensis* (Jerd.) as not specifically distinct from *Rana liebigii*.

*RANA VERRUCOSA*, sp. n.

Snout of moderate length, somewhat pointed, with indistinct canthus rostralis; tympanum rather small, smaller than the eye. Inner nares not quite so wide as the Eustachian tubes. Vomerine teeth in two oblique series, each commencing from the front margin of the inner nostril. Upper parts covered with numerous larger and smaller warts, tubercles, and short folds. Limbs well developed, the distance between vent and heel being equal to the length of the body. Tips of the fingers and toes scarcely swollen; the fourth toe one third longer than the fifth. Toes completely webbed; but the web does not extend to the extremity of the fourth toe. Metatarsus with an elongate inner and a minute outer tubercle.

Brownish, marbled with darker, sometimes with a broad yellow vertebral band. Limbs with cross bars; hinder part of the thighs black, with white vermiculated lines and spots. Lower parts whitish, throat sometimes marbled with brown.

Several specimens were collected by Lieut.-Col. Beddome in Malabar. The body of the largest is 60 millims. long; length of hind limb 103 millims.

*RANA PYGMÆA*, sp. n.

Similar in habit to a young *Rana kuhlii*. Head much depressed, with very short, rounded snout; canthus rostralis absent; eyes prominent, obliquely directed forwards. Skin smooth, with a few irregular folds behind the head. Tympanum hidden; inner nares and Eustachian tubes small. Vomerine teeth in two short groups close together, behind the inner nostrils. Limbs short; fingers and toes short, the latter half-webbed. One metatarsal tubercle. Upper parts nearly uniformly black or blackish brown, the lower dull yellow.

A minute species, the body of an adult female with mature ova in the oviduct being only 25 millims. long; length of hind limb 31 millims.

Several specimens were collected by Lieut.-Col. Beddome in Malabar.

*RANA HEXADACTYLA* (Less.).

The specimens named *Rana vittata* by Lieut.-Col. Beddome are the young of this species. Three other young specimens were presented to the Museum by Mr. Jerdon under the name of "*Pyxi-cephalus pluvialis*, Jerd."

*XENOPHRYS MONTICOLA* (Gthr.).

"*Xenophrys gigas*, Jerd.," is the adult of this species.

*DIPLOPELMA*.

In Mr. Jerdon's collection there are specimens which he has identified with the two species formerly named by him "*Engystoma rubrum*" and "*Engystoma carnicum*." Those to which he has applied the former name are, in my opinion, the same as *D. ornatum* (D. and B., Gthr.). The others, four in number, are from Assam; and two of them I am inclined to refer likewise to *D. ornatum*, whilst the other two are identical with *D. pulchrum* (Hallow.).

*NANNOPHRYS CEYLONENSIS* (Gthr.).

*Trachycephalus ceylanicus*, Ferguson, Ann. & Mag. Nat. Hist. 1875, vol. xv., is identical with this species.

*ANSONIA ORNATA*, sp. n. (Plate LXIII. fig. A.)

Anterior half of the back finely tubercular, the remainder smooth. Tympanum very distinct, about half the size of the eye. Fingers free, the first much shorter than the second. Toes short, broadly



webbed; two small metatarsal tubercles, no tarsal fold. Black; upper side of the head generally grey or with some greyish spots. Throat, abdomen, and the lower side of the legs with large bright yellow spots.

Several specimens were obtained by Lieut.-Col. Beddome from the Brumagherries.

	millim.
Length of body . . . . .	30
„ hind limb . . . . .	44
„ tarsus . . . . .	8
„ fourth toe . . . . .	12

#### BUFO BEDDOMII, sp. n.

Crown broad, flat, without bony enlargement. Snout short, projecting, with well marked canthus rostralis. Limbs of moderate length. The first and fourth fingers a little longer than the second. Toes broadly webbed. Metatarsus with two small callosities; no fold along the tarsus. All the upper parts covered with rough tubercles; parotoid ovate; about twice as long as broad. Tympanum very small; Eustachian tubes much narrower than choanæ. Above dark brown, with some indistinct black spots; the two inner fingers and the three inner toes whitish above. Lower parts whitish, densely marbled with black.

One specimen was obtained by Col. Beddome in Malabar; it is 43 millims. long; hind limb 61 millims.

#### BUFO HOLOLIUS, sp. n. (Plate LXIV. fig. A.)

Crown broad, flat, without bony enlargement. Snout short, depressed, projecting, with well marked canthus rostralis. Limbs and fingers rather short; the fourth finger a little longer than the second. Toes short, webbed at the base only. Metatarsus with two small callosities; no fold along the edge of the tarsus. Back with very flat, smooth, small glandular patches; also the parotoid is flat, scarcely raised above the level of the smooth skin. Tympanum perfectly circular, very distinct, not much smaller than the eye. Inner nares and Eustachian tubes narrow. Upper parts olive-coloured, marbled with brown; lower parts whitish.

One specimen was found by Col. Beddome in Malabar; it is 38 millims. long; hind limb 45 millims.

#### HYLORANA TEMPORALIS (Gthr.).

Specimens collected by Col. Beddome in the Anamallays, and determined as "*Hylorana flavescens*" by Mr. Jerdon in 1870, prove to differ from *H. temporalis* only by having the brown temporal band extended on to the sides of the body. There is no evidence whatever that this is the frog "with the yellow sides" named "*Rana flavescens*" by Mr. Jerdon in 1854.

#### POLYPEDATES CHLORONOTUS, sp. n. (Plate LXXV. fig. A.)

In habit somewhat resembling a *Hylorana*.

Snout of moderate length, somewhat pointed, with distinct canthus rostralis, and vertical, concave loreal region. Eye large. Tympanum one third the size of the eye in females, but larger in males. Limbs strong; disks well developed, those of the fingers rather larger than those of the toes. Fingers not webbed, the first rather longer than the second, and equal in length to the fourth, the third being the longest. Toes completely webbed; a single elongate metatarsal tubercle. Skin quite smooth, not adherent to the surface of the head; no indication of a curved osseous crest. Choanæ and Eustachian tubes of moderate width; vomerine teeth in two oblique series between the choanæ. Tongue without free papilla. Male with an external vocal sac behind each angle of the mouth. Upper surface of the head and back green (sometimes with some irregular black spots); sides of the head and body and the limbs dark brown, this colour being sharply defined towards the green of the back; lower parts whitish, with the throat and chest brownish. A white line along the upper lip towards the axil. Loins and hind part of the thighs marbled with whitish. Legs with dark cross bars above.

	Male. millim.	Female. millim.
Length of body . . . . .	51	93
„ hind limb . . . . .	93	175
„ tarsus . . . . .	15	28
„ fourth toe . . . . .	27	50

Several specimens were brought by Mr. Jerdon from Darjeeling.

This is the frog mentioned by Mr. Jerdon (Proc. As. Soc. 1870, p. 83) and described by Dr. Anderson (Proc. Zool. Soc. 1871, p. 208) as *Polypedates smaragdinus* of Blyth; but there is no evidence whatever that Blyth had this species before him; he merely says (Journ. As. Soc. Beng. xxi. p. 355):—"A tree-frog from the Naga hills, Assam (*P. smaragdinus*, nobis). Length of the body  $3\frac{1}{4}$  inches, hind limb  $5\frac{1}{4}$  inches. Wholly green above, changing in spirit to livid blue, underparts white." This vague diagnosis may apply to very different species, and certainly better to some than to the present frog from Darjeeling.

*POLYPEDATES FORMOSUS*, sp. n. (Plate LXV. fig. B.)

Habit similar to that of *P. afghana*.

Snout flat, short, rounded, with distinct canthus rostralis. Loreal region subvertical, with a very slight impression. Eye of moderate size; tympanum very small, only as large as the disk of the third finger. Limbs slender; fingers exceedingly long: the second longer than the first, but shorter than the fourth, the third exceeding the others in length; fingers not webbed, with large disks, larger than those of the toes. Toes fully webbed; metatarsal tubercle indistinct. Skin quite smooth. Choanæ and Eustachian tubes narrow; vomerine teeth in two very short groups between the choanæ. Tongue without free papilla. Upper parts green, mar-

bled with black, the black spots enclosing a number of small whitish dots. Legs and toes with black white-dotted cross bars. Lower parts light greenish, irregularly marbled with brown.

	millim.
Length of body . . . . .	64
„ third finger . . . . .	21
„ hind limb . . . . .	115
„ tarsus . . . . .	19
„ fourth toe . . . . .	37

One specimen from Khassya in Mr. Jerdon's collection.

**POLYPEDATES JERDONII**, sp. n.

Snout broad, depressed, extremely short and obtuse, with indistinct canthus rostralis, and flat, slanting loreal region. Eye of moderate size; tympanum very small, much smaller than one of the digital disks. Limbs of moderate length; disks large, nearly equally large on the fingers and toes. Fingers conspicuously webbed at the base: second and fourth equal in length, a little longer than the first, and shorter than the third. Toes two thirds webbed; one ovate metatarsal tubercle. Skin nearly smooth above, granular below. Choanæ and Eustachian tubes narrow; vomerine teeth in two oblique series between the choanæ. No free papilla on the tongue. Upper parts brownish grey; forehead and an irregular broad band on each side whitish. Whitish below, throat with some brownish spots; anterior and posterior sides of the femur nearly colourless. Dark bars across the legs irregular and sometimes confluent.

	millim.
Length of body . . . . .	48
„ hind limb . . . . .	68
„ tarsus . . . . .	11
„ fourth toe . . . . .	22

Two specimens from Darjeeling, in Mr. Jerdon's collection.

**POLYPEDATES BEDDOMII**, sp. n. (Plate LXIII. fig. B.)

Habit similar to that of *P. maculatus*.

Snout flat, moderately long, rather obtuse, with distinct canthus rostralis. Loreal region flat, slanting. Eye rather large; tympanum at least half as large as the eye. Limbs strong and rather long; second finger rather shorter than first, which nearly equals the fourth; third longest of all. Fingers without any web, but with the disks well developed. Toes two thirds webbed, the cutaneous fold reaching to the disks, except in the fourth toe, in which it extends to the antepenultimate joint only. Metatarsus with an indistinct, elongate tubercle. Skin of the back with short longitudinal folds; a glandular curved fold from behind the orbit above the tympanum, to the armpit. Choanæ and Eustachian tubes rather small; vomerine teeth in two short, scarcely oblique series, between the choanæ. A long, free, pointed, conical papilla on the

middle of the tongue\*. Upper parts light brownish olive, or pinkish, with some very obscure spots; a dark cross band between the eyes; a black band along the canthus rostralis, widening behind the eye, so as to cover the whole tympanum; legs obscurely barred; anterior and posterior sides of the thighs finely mottled with black.

	Spec. A. millim.	Spec. B. millim.
Length of body . . . . .	55	45
„ hind limb . . . . .	115	85
„ tarsus . . . . .	11	13
„ fourth toe . . . . .	30	24

Lieut.-Col. Beddome has collected specimens of this frog in Malabar and Travancore, in the Anamallays, and at Sevagherry.

#### POLYPEDATES BRACHYTARSUS, sp. n.

Closely allied to *P. beddomii*, but with a much shorter tarsus. Snout flat, somewhat pointed, with indistinct canthus rostralis; loreal region flat, slanting. Eye rather large; tympanum not quite half as large as the eye. Limbs of moderate length. Fingers without any web, and with moderately developed disks: the first, second, and fourth nearly equal in length, the third being the longest. Toes two thirds webbed, the cutaneous fold reaching to the disks, except in the fourth toe, in which it extends to the antepenultimate joint only. Metatarsus with a small indistinct tubercle. Skin of the back with short longitudinal folds; a glandular curved fold from behind the orbit, above the tympanum, to the armpit. Choanæ and Eustachian tubes of moderate size; vomerine teeth in two short oblique series. A free, pointed papilla in the middle of the tongue. Upper parts brown, mottled with darker; a broad, whitish, well-defined longitudinal band along the middle of the back to the end of the snout; an interocular brown band slightly encroaches upon the white band. Upper sides of the legs barred as usual; anterior and posterior sides of the thighs finely mottled with brown.

	Spec. A. millim.	Spec. B. millim.
Length of body . . . . .	55	38
„ hind limb . . . . .	99	58
„ tarsus . . . . .	15	10
„ fourth toe . . . . .	26	17

Two specimens from Lieut.-Col. Beddome's collection—one from the Anamallays, the other from Sevagherry.

#### POLYPEDATES BREVIPALMATUS, sp. n.

Habit similar to that of *P. maculatus*.

Snout short, flat, obtuse, with indistinct canthus rostralis; loreal

\* I do not find that the presence of this papilla has been noticed before, although it is present in some of the other species of *Polypedates* and *Ixalus*; it is absent in *P. maculatus*. I do not know its function.

region flat, slanting. Eye of moderate size; tympanum about one third the size of the eye. Limbs of moderate length; disks rather small. Fingers without any web: the second rather longer than the first, and equal to the fourth, the third being the longest. Toes long, with a very short web. Metatarsal tubercle elongate. Skin of the back more or less tubercular, or nearly smooth. Choanæ and Eustachian tubes rather narrow; vomerine teeth in two very short series between the choanæ. A free, pointed papilla in the middle of the tongue. Upper parts brownish olive, mottled with brown; a dark interocular cross band; legs barred as usual. Lower parts more or less marbled with brown, sometimes brown with white dots, sometimes uniform whitish; anterior and posterior sides of the thighs mottled with brown.

	Spec. A. millim.	Spec. B. millim.
Length of body . . . . .	44	34
„ hind limb . . . . .	86	64
„ tarsus . . . . .	14	11
„ fourth toe . . . . .	25	19

Several specimens were collected by Lieut.-Col. Beddome in Malabar, and one in the Anamallays.

#### IXALUS VARIABILIS (Gthr.).

This species is not confined to Ceylon, but occurs in various parts of Southern India; it is common at Pycara. The variations of colour are endless, and frequently render the determination a task all the more difficult, as some of them approach closely the distribution of colours in other species. There are specimens with sub-crescentic brown bands on the back as in *Polypedates microtympanum*; others have round, milk-white spots about the lips, or on the sides, or all over the back. One variety has the back of a nearly uniform chocolate-brown, and a light-coloured band along each side. A whitish line along the canthus rostralis and superciliary margin is very frequent.

It is possible that the specimens which Mr. Jerdon noticed as *Phyllomedusa* (?) *wynaadensis* belonged to this species. But in a genus in which the distinction of closely allied species is most difficult for the zoologist with the specimens before him, it is impossible to say to which of them a short, insufficient note, penned 25 years ago, refers.

#### IXALUS GLANDULOSUS (Jerd.).

The specimens we have received from Mr. Theobald of this species were identified by him as the *Ixalus* (?) *glandulosa* of Jerdon—and, as I think, very properly, the sides of the specimens being largely glandular. On the other hand, Col. Beddome has collected specimens of the same species, which were determined by Mr. Jerdon himself as his *Phyllomedusa* (?) *tinniensi*. It will be difficult to decide from the original notes with which these names are accompa-

nied which of the two names ought to be applied, or whether they are synonyms.

*IXALUS MONTANUS*, sp. n. (Plate LXVI. fig. A.)

Snout short, as long as the eye, obtusely rounded in front, with distinct canthus rostralis. Tongue with a free, pointed papilla in the anterior part of the median line. Tympanum hidden below the skin. Skin nearly smooth, only in adult examples with some indistinct tubercles. The length of the body is more than the distance between vent and heel. No fold along the tarsus; metatarsus with a small, indistinct tubercle; fingers quite free; toes with a very short web; disks of moderate size. Old examples are nearly entirely of a dark purplish brown above, with scarcely any markings, the posterior side of the femur being marbled with black. Other specimens are of a lighter colour, with more or less symmetrical brown markings, the forehead being light-coloured. Abdomen sometimes uniform whitish, sometimes more or less reticulated with black.

Lieut.-Col. Beddome obtained this species on the Kudra Mukh, at an elevation of 6000 feet. One of the largest specimens is 38 millims. long, the length of the hind limb being 55 millims.

*IXALUS DIPLOSTICTUS*, sp. n. (Plate LXIII. fig. C.)

Snout of moderate length, rather pointed, with distinct canthus rostralis. Tongue with a free, pointed papilla in the anterior part of the median line. Tympanum distinct, not quite half the size of the eye. Skin of the back with some longitudinal folds. The length of the body equals the distance between vent and heel. A cutaneous fold along the tarsus, commencing from the single metatarsal tubercle; fingers quite free; toes slender, with a very short web. Disks small. Pinkish olive-coloured, with a black line along the canthus rostralis, broader behind the eye, and continued over the tympanum. Symmetrical black spots on the sides—one in front of the axil, another on the middle of the side of the trunk, a third above the loin; one or the other of these spots may be absent. Legs with dark cross bars; anal region and soles of the feet black. Abdomen light-coloured; throat sometimes mottled with brown.

Several specimens were collected by Lieut.-Col. Beddome in Malabar. One of the largest is 27 millims. long, the length of the hind limb being 46 millims.

*IXALUS CHALAZODES*, sp. n. (Plate LXVI. fig. B.)

Snout short, as long as the eye, obtusely rounded in front, with indistinct canthus rostralis. Tongue with a free, pointed papilla in the anterior part of the median line. Tympanum covered by the skin. Skin smooth; but in the inguinal region there are several series of white, smooth tubercles; several smaller similar tubercles in the anal region and along the tarsus; the length of the body is equal to the distance between vent and heel; no fold along the tarsus; metatarsus with a small indistinct tubercle; fingers quite free; toes half-

webbed; disks large. Upper parts uniform greenish, the tubercles mentioned showing like white dots. Lower parts yellowish white. The anterior and posterior sides of the femur yellow, slightly marbled with green.

One adult female was obtained by Lieut.-Col. Beddome from Travancore; it is 26 millims. long, the length of the hind limb being 42 millims.

*IXALUS JERDONII*, sp. n.

Snout very short, somewhat pointed, with distinct canthus rostralis. Tongue with a free pointed papilla in the anterior part of the median line. Tympanum extremely small, but distinct. Skin smooth. The length of the body is rather more than the distance between vent and heel. No fold along the tarsus; metatarsal tubercle small, indistinct; fingers with a rudimentary web; toes short, half-webbed. Disks moderately developed. Reddish olive, with indistinct darker markings on the back. Femur colourless in front and behind. Lower parts whitish. Length of body 43 millims., of hind limb 63 millims.

A single specimen from Jerdon's collection; on the bottle it was marked as coming from Darjeeling; but it is possible that this is the same specimen mentioned by Jerdon as having been found by him "in the Khasis," Proc. As. Soc. Beng. 1870, p. 85.

*IXALUS BEDDOMII*, sp. n.

Allied to *Ixalus femoralis* and *I. pulchellus*, but with a distinct canthus rostralis. Snout short, as long as the eye, obtusely rounded in front. Tongue without free pointed papilla in the middle. Tympanum very small, covered by the skin. Skin on the back smooth. The length of the body is nearly equal to the distance between vent and metatarsal joint. No fold along the tarsus; metatarsus with a small indistinct tubercle; fingers quite free; web between the toes very short; disks well developed. Upper parts uniform green, the lower whitish. The anterior and posterior sides of the femur are perfectly colourless; and only a narrow stripe along its upper side is green.

Several specimens, collected by Lieut.-Col. Beddome in Malabar, are 23 millims. long, the length of the hind limb being 35 millims.

*IXALUS STICTOMERUS*, sp. n. (Plate LXVI. fig. C.)

Snout of moderate length, rather pointed, with distinct canthus rostralis. Tongue without free pointed papilla in the middle. Tympanum very small, distinct. Skin smooth. The length of the body is less than the distance between vent and metatarsal tubercle; a cutaneous fold along the tarsus, commencing from the single small metatarsal tubercle; fingers with rudimentary web; toes of moderate length, half-webbed. Disks moderately developed. Olive-coloured, with indistinct symmetrical markings on the back, an interocular cross bar being darkest. A dark streak along the canthus rostralis is continued over the tympanum. Femur with three very indistinct

cross bars above, its anterior and posterior sides being blackish minutely marbled with white. Lower parts whitish.

A single specimen was obtained by Lieut.-Col. Beddome in Ceylon; it is 34 millims. long, the length of the hind leg being 48 millims.

#### HYLA ANNECTENS.

The frog mentioned by Mr. Jerdon as *Polypedates annectens* proves to be a species of *Hyla* closely allied to *H. chinensis*.

#### CALLULA TRIANGULARIS, sp. n.

Closely allied to *C. obscura*.

Back nearly smooth, with some flat tubercles in the middle. Fingers quite free, with the extremities truncated; toes free, of moderate length, not dilated at the ends. Tarsus without fold; metatarsus with two small tubercles. Olive-coloured above, with a large triangular black spot occupying nearly the whole length of the back, commencing from the occiput. Sides of the head and body, legs, and lower parts black, with olive-coloured spots.

Several specimens were obtained by Lieut.-Col. Beddome in Malabar. The largest are only 31 millims. long, the length of the hind limb being 40 millims. and of the free part of the fourth toe 8 millims.

#### CALLULA OLIVACEA, sp. n. (Plate LXIV. fig. B.)

Snout short, not very obtuse. Skin of the back nearly smooth, with scarcely any tubercles. Limbs of moderate length. Fingers long, quite free, with broad, truncated disks. Toes with a rudimentary web only, and not dilated at the ends. Tarsus without fold; metatarsal tubercles two, small. Olive-coloured above, marbled with black; lower parts white.

	millim.
Length of body .....	27
„ third finger .....	4.5
„ hind limb .....	33
„ tarsus .....	6
„ fourth toe .....	10

Two specimens were found by Lieut.-Col. Beddome on the Yella-gerry hills at an altitude of about 2000 feet.

#### PEDOSTIBES, g. n.

Differing from *Callula* in its physiognomy and habit, which resemble that of *Bufo*. Palate concave, without any transverse ridges.

#### PEDOSTIBES TUBERCULOSUS, sp. n. (Plate LXIV. fig. C.)

Body rather narrow and slender; head flat above, with short, pointed snout, distinct canthus rostralis, and perpendicular loreal region. Tongue narrow. Choanæ narrow; Eustachian tubes very narrow. Eye rather large. Tympanum extremely small, but distinct. Legs rather slender. Fingers dilated, distinctly webbed at



the base, with broad, truncated disks: the first very short, the second nearly twice as long, the fourth longer than the second, and the third the longest. A broad metacarpal tubercle. Toes rather short, broadly webbed, with truncated ends. Two small metatarsal tubercles; no tarsal fold. Skin of the upper parts tubercular, the largest tubercles being arranged along each side of the back; the upper surface of the head nearly smooth. Brownish grey, sides darker. A white band from below the eye to the axil; another white longitudinal band in the lumbar region. Lower parts whitish, spotted with black.

	millim.
Length of body . . . . .	35
„ hind limb . . . . .	48
„ tarsus . . . . .	8
„ fourth toe . . . . .	13

Two specimens from Malabar (*Lieut.-Col. Beddome*).

#### GEGENES (g. n. Cœciliid.).

Allied to *Epicrium*, but with the labial groove advanced to the front margin of the mouth, and very indistinct annular folds of the skin. Eyes not visible.

#### GEGENES CARNOSUS.

*Epicrium carnosum*, Beddome, Madr. Month. Journ. Med. Sc. 1870, p. 176.

Head depressed, of moderate width; body slender, cylindrical; tail extremely short, obtuse. Eyes not visible; mouth narrow, the labial grooves, or rather pores, are on a level with the front teeth, the nostrils close to the extremity of the snout. Upper jaw projecting beyond the lower. The skin of the body forms about 116 folds between the head and end of the tail; they are all indistinct, and quite obsolete on the back, only the hindmost being perfectly annular. Colour uniform brownish olive.

Two specimens, 7 inches long, were obtained by *Lieut.-Col. Beddome* from Periah Peak, Wynaad, at an altitude of about 5000 feet.

#### EXPLANATION OF PLATES LXIII.-LXVI.

##### PLATE LXIII.

- Fig. A. *Ansonia ornata*, p. 568. | Fig. C. *Ixalus diplostictus*, p. 574.  
 B. *Polypedates beddomii*, p. 571. |

##### PLATE LXIV.

- Fig. A. *Bufo hololius*, p. 569. | Fig. C. *Pedostibes tuberculosus*, p. 576.  
 B. *Callula olivacea*, p. 576. |

##### PLATE LXV.

- Fig. A. *Polypedates chloronotus*, p. 569. | Fig. B. *Polypedates formosus*, p. 570.

##### PLATE LXVI.

- Fig. A. *Ixalus montanus*, p. 574. | Fig. C. *Ixalus stictomerus*, p. 575.  
 B. — *chalaodes*, p. 574. |

2. List of Birds met with in North-eastern Queensland, chiefly at Rockingham Bay. By E. PIERSON RAMSAY, F.L.S. &c.

[Received August 24, 1875.]

1. *AQUILA AUDAX* \*.

Scarce near the coast, but plentiful over the coast-range on the tablelands.

2. *HIERAËTUS MORPHNOIDES*.

This rare and interesting species is by no means easily obtained; a few specimens have visited the coast-range near the heads of the Herbert river, and on the tablelands. Mr. J. B. White procured several fine specimens of both sexes at Springsure and on the Barkoo river; and it is also found about 100 miles inland from Rockhampton. The sexes differ considerably in size; and individuals of both sexes vary in the colour and intensity of the plumage, some being of a rich dark rufous or rusty brown, others light buff (almost white) on the abdomen, pale rusty brown on sides of chest and flanks, a stripe of blackish brown down centre of each feather; the sexes and individuals of the same sex also differ greatly in size. A small male in the Dobroyde Collection measures:—total length 16·5 inches; bill, from forehead, along the culmen, 1·4, from cere, along culmen, 1·2, from cere to tip 1·1; wing 13, tail 7·8, tarsus 2·3. A female in the Australian Museum, total length 22 inches, wing 15·85, tail 9·8, bill 1·4, culmen 1·7, tarsus 2·8.

3. *POLIOAETUS LEUCOGASTER*.

Plentiful everywhere along the coast. I have noticed them seize Plover and *Porphyrio* as they rose from the swamps.

4. *HALIASTUR LEUCOSTERNUS*.

Very common all along the coast, they venture as far south as the Clarence river, where they are considered rare, and extend northwards to Cape York and coast of New Guinea. Eggs 2 in number, dirty white, sparingly blotched with reddish brown, length 2·1 by 1·65 inch.

5. *HALIASTUR SPHENURUS*.

A species with great range of habitat; it frequently ascends river-districts into the interior, and it is to be found on many of the lakes inland.

6. *PANDION LEUCOCEPHALUS*.

By no means rare, but not often procurable; it ranges as far south as the Clarence river. I have specimens of the eggs of this species taken from a nest of sticks built in a Eucalyptus overhanging the Brisbane river; they are 2 in number, 2·5 inches long by 1·65 in breadth, of a dirty white, strongly blotched with deep rust-red spots and markings, with a few blotches of slaty blue—a very handsome egg.

\* Where no references are given, the names are taken from Gould's 'Hand-book.'

7. *FALCO HYPOLEUCUS*.

This exceedingly scarce bird was met with by Inspector Robert Johnstone, Esq., of the Herbert river, on the tablelands due west of Cardwell, and on the ranges thereabouts; J. B. White, Esq., of Springsure, due west inland from Rockhampton, likewise noticed it, and was fortunate enough to obtain several specimens. The young differ slightly from the adults, and, like others of the tribe, are occasionally mottled with brown on leaving the nest.

8. *FALCO LUNULATUS*.

One female, shot on Herbert river, belongs to the large light-coloured variety of this species.

9. *FALCO SUBNIGER*.

I am indebted to J. B. White, Esq., of Springsure, for much information respecting our Australian Falconidæ and for a specimen of the present species, procured by that gentleman in the Barkoo district. Mr. R. Johnstone also noticed it on the tablelands inland, about 40 miles from Cardwell, and on the Sea-view range.

10. *LEUCOSPIZA NOVÆ-HOLLANDIÆ*.

Not a common species; only two or three specimens obtained; they are larger than our New-South-Wales birds, and barred with longitudinal blotches of dull brown on the breast and flanks; the backs of all were brown. Sex uncertain. No purely white birds seen.

11. *ASTUR APPROXIMANS*.

Adults and young obtained. This species seems more plentiful than the *Accipiter*.

12. *ACCIPITER TORQUATUS*.

Several observed on the margins of the scrubs; only one shot (male).

13. *ELANUS AXILLARIS*.

Apparently scarce; only shot one specimen.

14. *MILVUS ISURUS*.

I met with this rare species only on one occasion; there is a fine specimen in the Australian Museum, shot by Mr. Masters on the Burnet river, Queensland.

15. *MILVUS AFFINIS*.

Common everywhere at times, and found chiefly on the open grass-lands in the neighbourhood of the Herbert and Mackay rivers.

16. *BAZA SUBCRISTATA*.

Usually found in pairs about the margins of the scrubs and bushes. It is a harmless, inoffensive species, feeding chiefly on insects and their larvæ, or occasionally on dead animals.

17. *CIRCUS ASSIMILIS*.

Occasionally met with on the open grass-lands of the Herbert river. Mr. White obtained five examples inland from Rockhampton, at Springsure, and on the Barkoo river.

18. *CIRCUS GOULDI*.

Plentiful enough at times; they often assemble in small flocks, and may be seen skimming over the open grass-beds and seizing the Quail and other small birds as they rise. If no Hawks are to be seen, a good method to obtain specimens is to set fire to the grass, when several species will soon arrive, and some may be seen dashing almost into the flames after the birds as they rise.

19. *STRIX TENEBRICOZA*.

Very rare; only one specimen, obtained in the bushes near Dalrymple's Gap.

20. *STRIX NOVÆ-HOLLANDIÆ*.

This species is now plentiful in the bushes of the coast-range. I noticed in Mr. J. B. White's collection, obtained at Springsure, a very dark-faced variety; the facial disk was of a deep chestnut; another shot at Dalrymple's Gap on the coast-range has the disk almost white, and large spots on the under surface. It is a very variable species.

21. *STRIX DELICATULA*.

I examined one specimen shot near the township of Cardwell; it does not appear to differ from the usual New-South-Wales form of this species.

22. *SPILOGLAUX BOOBOOK*.

One specimen, shot by my collector near Cardwell, is slightly larger than the ordinary birds of the same species found in New South Wales. Colouring the same.

23. *HIERACOGLAUX CONNIVENS*.

This species seems to be more plentiful than *Spiloglaux boobook*; neither are they by any means rare.

24. *PODARGUS*, sp.

I have again to observe that two species, quite distinct from one another in the form of the bill as well as in colour, have been procured; these are also distinct from those obtained by my late collector, Spalding, in the same district several years ago. The species of this genus are in such glorious confusion that it is almost impossible to recognize any of them from bare descriptions.

The two I have lately acquired are certainly distinct from any figured in Mr. Gould's work on the Birds of Australia.

25. *PODARGUS PAPUENSIS*.

Very scarce; one specimen is slightly smaller than those I have obtained from Cape York.

26. *PODARGUS PHALÆNOIDES*.

One specimen only procured ; it is looked on as a very rare bird at Cardwell.

27. *PODARGUS MARMORATUS*.

One specimen only shot, at Salt-water Creek, near Cardwell.

28. *EUROSTOPODUS GUTTATUS*.

Plentiful at times ; several specimens were obtained. They fly low over the clearings and grassy flats for about an hour at dusk. Its single egg is laid on the ground without any preparation for it, usually near some stone or stump on the side of a stony ridge ; the ground-colour is of light-greenish, creamy white, sparingly marked all over with dots and oval spots of blackish and slaty brown, a few appearing as if beneath the surface of the shell. Length 1·38 by 1 inch in breadth, both ends nearly equal.

29. *EUROSTOPODUS ALBOGULARIS*.

I shot several of this species on the Mary river, but only obtained one specimen from the Cardwell district. The egg resembles that of *E. guttatus*, without the greenish tinge on the ground-colour, which is of a rich, light cream-colour, spotted sparingly all over with round dots and oval-shaped marks of black, blackish brown, and slaty black, which latter appear beneath the surface of the shell ; length from 1·41 to 1·5 inch, breadth from 1·03 to 1·03, equal at both ends.

I found this species breeding both at Brisbane and on the Mary river. My brother, James Ramsay, Esq., of Nanama, forwarded to me authentic eggs from the Merule in the Riverina district of New South Wales.

I take the present opportunity of correcting a mistake respecting the egg of this species that I described as such in the list of birds from Port Denison (P. Z. S. 1875, p. 113) ; it evidently belonged to the following bird (*Caprimulgus macrurus*). Rainbird, who was not aware of the generic difference between the two birds, sent me a *Eurostopodus* instead of a *Caprimulgus*, the great similarity in the plumage of these two Australian species evidently misled him.

30. *CAPRIMULGUS MACRURUS*.

This species is plentiful near Cardwell ; many specimens were procured. I am indebted to Inspector Robert Johnstone for a fine pair of their eggs ; they were found on the ground on the side of a ridge near the Herbert river, and are of a light rich cream-colour, fading to whitish after being emptied, clouded all over with fleecy markings of pale slaty lilac, which appear beneath the surface of the shell ; length 1·1 by ·81 inch in breadth.

31. *CHÆTURA CAUDACUTA*.

Met with on the plains inland and flying over the extensive grass beds on the lower Herbert.

32. *CYPSELUS TERRÆ-REGINÆ*, Ramsay, P. Z. S. 1874, p. 601.

I met with this interesting species upon several occasions. Their flight is remarkably swift, and resembles that of the Spine-tailed Swallow (*C. caudacuta*); their actions are also similar. Very difficult to procure.

33. *HIRUNDO FRONTALIS*.

This species seems to visit all parts of Australia; I noticed no difference between the individuals from the Herbert river and those in New South Wales.

34. *LAGENOPLASTES ARIEL*.35. *HYLOCHELIDON NIGRICANS*.

I found both species assembled together in large numbers at Upper Herbert in April; they were evidently preparing for migration.

36. *MEROPS ORNATUS*.

Common everywhere during April in immense numbers, adults and the young of the year evidently preparing for their annual migration.

37. *EURYSTOMUS PACIFICUS*.

Plentiful about the township of Cardwell and elsewhere.

38. *DACELO GIGAS*.

Not so common as the next species; only two or three pairs noticed. Their different note at once distinguishes them even at a great distance.

39. *DACELO LEACHII*.

Plentiful and easily procured when *not* wanted! The furthest south I have noticed this species was about the Mary and Burnet rivers; but I have received specimens said to have been shot at Toowoomba, some distance inland from Brisbane.

40. *TODIRAMPUS SANCTUS*.

This species was not plentiful; a few specimens shot, but unfortunately in the moult, were slightly smaller than the New-South-Wales birds.

41. *TODIRAMPUS PYRRHOPYGIUS*.

I give this species on the authority of Inspector R. Johnstone, who observed it about 50 miles inland from the coast; it has a very extensive range of habitat. In December 1869 it visited Dobroyde, near Sydney.

42. *TODIRAMPUS SORDIDUS*.

This species is by no means rare; but usually inhabits the mangrove-swamps and margins of the rivers near the mouth, where they are not easily obtained.

## 43. CYANALCYON MACLEAYI.

I seldom found this species on the river-banks. Inland it is plentiful, being the most common species. They excavate a hole in a nest of the White Ant (*Termes*), and, enlarging it into a chamber near the end, lay 4 or 5 round glossy white eggs, slightly smaller than those of *Halcyon sanctus*.

## 44. ALCYONE PULCHRA.

This appears to me to be only a northern variety of *Alcyone azurea*. It is common on all the creeks and rivers.

## 45. ALCYONE PUSILLA.

By no means rare, but seldom found away from the creeks in the very densest parts of the scrubs; it is always difficult to procure. Its note is a shrill, weak, piping cry, emitted chiefly while on the wing. Several specimens obtained. There is no difference in the plumage of the sexes.

## 46. TANYSIPTERA SYLVIA.

This lovely bird, I noticed, inhabited the most dense parts of the scrubs; I never saw the birds in any of the open parts; except diving across from one side of a gully to the other, they always keep to the low Palms and are more frequently heard than seen; their note is a shrill cricket-like chirrup.

## 47. GYMNORHINA TIBICEN.

By no means common; I regret I did not shoot some specimens; they appeared much smaller than our New-South-Wales birds, although their flute-like note is identical. Met with in the open forest-country.

## 48. CRACTICUS NIGROGULARIS.

## 49. CRACTICUS TORQUATUS.

I did not observe any difference in these and individuals of the same species from New South Wales.

## 50. CRACTICUS QUOYII.

This handsome species differs in its habits from all the other members of the genus. It frequents the mangrove-swamps and dense bushes about the rivers, where its presence is every now and then betrayed by its loud ringing note, emitted chiefly when on the move. For the most part it resorts to the tops of the trees, and feeds on various insects of several families.

## 51. GRAUCALUS MELANOPS.

Common, frequenting the open country.

## 52. GRAUCALUS MENTALIS.

Usually seen in pairs or small troops of 4 or 5 in number, frequently on margins of scrubs &c. or in the open forest-country.

53. *GRAUCALUS HYPOLEUCUS*.54. *GRAUCALUS SWAINSONI*.

Both species seem plentiful and confined to the scrubs and bushes.

55. *ARTAMUS SORDIDUS*.56. *ARTAMUS LEUCOPYGIALIS*.57. *ARTAMUS CINEREUS*.

All plentiful after the breeding-season ; they move about in troops, sometimes all three species together, sometimes separately and visiting certain localities alternately. The young of *A. cinereus* are striated with whitish on the head and back, like the young of other members of the genus.

58. *ARTAMUS MINOR* (Viell.).

My collector obtained several of this species from a troop visiting Salt-water Creek, near Cardwell ; they frequented the open parts of the forest-lands and paddocks in the vicinity. I have met with them as far south as the Mary river. There is no difference in the plumage of the sexes.

59. *PARDALOTUS MELANOCEPHALUS*.

Perhaps the most common species. It resorts to the topmost leafy twigs, where it secures its food of insects and their larvæ. The nest is at the end of a long narrow burrow in the side of a bank, where a chamber is hollowed out and lined with narrow strips of bark or grasses for the reception of the eggs, which are 4 in number, snow-white, and a little larger than those of *P. punctatus*.

60. *PARDALOTUS PUNCTATUS*.

This seems a rare species, and was only met with once. *P. affinis* and *P. striatus* were not obtained within 100 miles of Cardwell, and have consequently been omitted from this list ; I have no doubt, however, that they will eventually be found in the Rockingham Bay district.

61. *STREPERA ANAPHONENSIS*.

I met with this easily recognized species upon several occasions in the open forest-country about the head-waters of the Herbert.

62. *CAMPEPHAGA KARU*.63. *CAMPEPHAGA JARDINII*.

Both species commonly found among the leafy boughs of trees on the margins of scrubs.

64. *PACHYCEPHALA RUFIVENTRIS*.65. *PACHYCEPHALA MELANURA*.

I did not find either of these species plentiful, and only obtained one of each.



66. *COLLURICINCLA PARVULA*.

I noticed that individuals of this species are much more highly coloured and deeper in tint than those I obtained from the Richmond and Clarence rivers in New South Wales. It is one of the most common birds on the Herbert river, and has a very pleasing and varied note, imitating and mocking almost every bird it hears. It is lively and graceful in all its actions, the first up in the morning and the last to roost at night; the scrubs resound with its pleasing song. The nest is composed of shreds of bark, grasses, and skeletons of leaves, &c.; it is cup-shaped, similar but smaller than that of *C. harmonica*. The eggs, 4 in number, white, with black and slaty-brown dots and spots.

67. *OREOICA GUTTURALIS*.

Found only in the open forest-land about 25 miles inland.

68. *CHIBIA BRACTEATA*.

A very common species; I frequently observed them taking their food on the wing at dusk. They appear always to be noisy and pugnacious.

69. *RHIPIDURA ALBISCAPA*.70. *RHIPIDURA RUFIFRONS*.

These species were only met with on one or two occasions in the bushes on the Herbert river; they appear to be rare in these parts.

71. *RHIPIDURA ISURA*.

Not finding any notice of the superciliary stripe in Mr. Gould's description of this bird, I was induced to consider it distinct, and described it under the name of *R. superciliosa* in P. Z. S. 1874, p. 604. Since, however, having had access to the folio edition of Mr. Gould's work, I find they are identical. This species has more of the habits of *Sauloprocta motacilloides*. It frequents the open parts of the forest and margins of the scrubs.

72. *SAULOPROCTA MOTACILLOIDES*.

Common everywhere on the margins of scrubs near dwellings and on the open plain.

73. *SEISURA INQUIETA*.

Not plentiful, met with occasionally.

74. *PIEZORHYNCHUS NITIDUS*.

Plentifully distributed over the whole district; frequents mangroves and thick brushes on the margins of creeks and rivers. A very pleasing and active bird.

75. *ARSES KAUPII*.

On a better acquaintance with this species, I find its habits closely

resemble those of *Rhipidura albiscapa*, especially in spreading its tail, creeping and hopping, with its wings half open, about on the trunks of the trees, often head downwards, searching under leaves and loose bark for insects, or darting out here and there to capture one on the wing. Its actions are lively and pleasing in the extreme; and when close by, the blue ring round the eye is plainly visible and conspicuous. This species is not rare, but seems to frequent the same parts of the dense scrubs throughout the whole season. I noticed several pairs in the Herbert-river brushes, and frequently returned to the same place day after day to watch them and wait for Casuaries; at such times I had ample opportunities of studying the habits and actions of many other species, which would frequently come within a few feet of me, and in more than one instance perched on my hat.

#### 76. MYIAGRA PLUMBEA.

I shot a few specimens in the hopes of finding *M. latirostris*, but did not find them differ from the New-South-Wales specimens.

#### 77. MYIAGRA NITIDA.

Like the preceding species, I found this bird plentiful in the dense brushes and scrubs on the Herbert river and other parts of the district.

#### 78. MACHÆRIRHYNCHUS FLAVIVENTER.

I was delighted to find this pretty species, and secured some fine skins just in time, as they had just finished breeding, and in a few days afterwards I found them moulting, January 1874.

#### 79. MICRÆCA FASCINANS?

On one occasion only I met with a bird which I believe to be of this species; having more important birds in view, did not secure any specimens.

#### 80. MICRÆCA FLAVIGASTER.

This bird is not plentiful, and was only found after several weeks' diligent search. Inhabits the tops of the trees in the open grass-lands. I never heard it singing as its representative *M. fascinans* is wont to do in New South Wales; and only on one occasion did I find them near any of the settlers' residences. They moulted earlier than any other birds in the district, being found in full new plumage on April 28, 1874.

#### 81. MONARCHA CARINATA.

Common in dense scrubs. It builds a neat nest among upright twigs, round, open above, composed of grasses and fine shreds of bark, the outside completely covered with bright green moss (*Hypnum dendroides* &c.). The eggs, two or three in number, are white, thickly sprinkled with light reddish chestnut or reddish brown spots and dots.

## 82. MONARCHA TRIVIRGATA.

One of the most common scrub birds. Its actions are more animated than those of *M. carinata*; it constructs the same kind of nests, in similar places, and of the same materials; also lays eggs two or three in number, of the same colour and markings, only differing a little in size.

## 83. GERYGONE ALBOGULARIS.

This species just arrived in time, before I left the Herbert, to be entered in the list; their arrival was announced by their pretty, melodious song, about the end of April. They arrive to breed with us in New South Wales in September or late August. If I remember right, their nest and eggs I have fully described previously,

## 84. GERYGONE CULICIVORA?

This is either *G. culicivora* or a new species. It is found common among the dense belts of mangroves near Cardwell; we found several of its nests containing eggs and young birds on Feb. 26, when my young friend Master I. Sheridan, an enthusiastic young naturalist, kindly waded nearly up to his thighs in black mud to secure them for me; one nest contained the eggs of a Cuckoo, exactly the same as that of *Chrysococcyx plagosus*, but smaller than any eggs of that bird I have hitherto met with; it is probably the egg of *C. minutillus*. The nest is a somewhat bulky structure, and resembles closely a lump of débris left by the floods hanging to the end of some leafy twig, it is composed of shreds of bark, dried water-weeds, and withered grasses, selected, I have no doubt, from the débris of the floods, plentiful on every side. It is oval oblong, with a small side entrance, and suspended by the top to the end of some hanging branch, often a considerable distance from the shore. The eggs are white, with a few dots of brown at the larger end; some altogether white, without any markings.

## 85. GERYGONE, sp. inc.

One of the most common species, always to be found in the dense scrubs by its pleasing twittering note. The birds were in full moult when shot. A *very indistinct* dark bar across tip of the tail, otherwise like *G. alboocularis*.

## 86. ERYTHRODRYAS ROSEA.

One pair noticed on the margin of a dense scrub; although frequently watched for hours, no nest was discovered.

## 87. PETROICA MULTICOLOR.

## 88. MELANODRYAS CUCULLATA.

Both species appear to be residents; they are not plentiful, but met with on several occasions in the open forest-lands, and near the homesteads of the settlers.

89. *PÆCILODRYAS SUPERCILIOSA*.

Found frequenting the outskirts of scrubs and thinly wooded banks of the rivers.

90. *PÆCILODRYAS? CINEREIFRONS*, sp. nov.

Head dark ashy grey, slightly tinged with olive on the crown; a broad ashy-grey band extends from over the eye to the back of the head; lores and chin blackish brown; throat and a short broad line extending just under the eye white; ear-coverts, nape, interscapular region, mantle, and rump olive-brown; the upper tail-coverts and tail olive, washed with rufous; inner webs of the tail-feathers dark ashy brown, the outer three feathers on either side margined with a well-defined line of white at the tips; under surface of the tail dark ashy brown; under tail-coverts and flanks rich buff; abdomen white; breast and chest ashy grey, becoming white on the throat; sides tinged with olive-brown; under surface of the wings dark ashy brown, having a white band crossing the wing near the base of the primaries and secondaries; under wing-coverts dark ashy brown, a spot of white at the base of the spurious wing; under surface of the shoulder white, the upper surface of the shoulder ashy grey; the wing-coverts above and the concealed portions of primaries and secondaries blackish brown; the scapulars and terminal half of the outer web of primaries and secondaries olive; the basal portion blackish brown, having a broad white band extending through them across the wing, just in front of the greater wing-coverts, and being broader on the secondaries nearest the body, but not extending on to the scapulars. Bill black at the base, white at the tip and along the under margin of lower mandible; legs, feet, and nails flesh-colour.

Total length 5·7 inches; bill from forehead ·8, from nostril ·45, from angle of the mouth ·9, height at the nostrils ·25, width ·2; wing 3·9 inches; tail 2·9; tarsus 1·2; hind toe ·5, its claw ·3; middle toe ·65, its claw ·25; outer toe ·55, its claw ·2; inner toe ·45, its claw ·2.

*Hab.* Brushes of the coast range near Cardwell, Rockingham Bay.

*Remarks.*—In habits and actions this species closely resembles the *Eopsaltria*, and like them may be seen perching frequently on the side of the upright stems of the trees.

91. *EOPSALTRIA CAPITO*.

Plentiful in the dense parts of the brushes. Their habits resemble *E. australis* of New South Wales.

92. *EOPSALTRIA INORNATA*, Ramsay, P. Z. S. 1874, p. 604.

In habits it resembles the preceding, but is either very rare or easily overlooked. It has been found in the scrubs on the Endeavour river.

93. *PSOPHODES CREPITANS*.

The specimens shot of this species were a trifle smaller than those from New South Wales. The nest is a rather bulky structure, com-

posed of rootlets, and skeletons of leaves and ferns, &c., lined with finer material, and sometimes, I am told, with feathers; it is not unlike a very large-sized nest of *Sericornis frontalis*, or a bulky nest of *Malurus cyaneus*, it is dome-shaped, with a comparatively large opening in the side, and placed in low bushes surrounded by vines &c. The eggs are three to four in number, of a greenish-white colour, with blackish, irregular, linear-shaped markings, some twisted and looped; a few on the larger end, where they are most numerous, are of a slaty blue, and appear beneath the surface of the shell; on the thicker end of some, hair-lines of black predominate, and, crossing and looping over one another, form here and there a black blotch. Length 1.1 to 1.2 inch, by 0.8 to 0.85.

94. *MALURUS CYANEUS*.

I met with this species at Port Dennison, but not further north if I remember rightly.

95. *MALURUS AMABILIS*.

96. *MALURUS HYPOLEUCUS*, Gould, Suppl. B. A. pl. 22.

These birds, whether they be of the same species or not, were found together on the open grass-lands in the neighbourhood of Cardwell, in the vicinity of scrubs. It has not by any means been proved that they are male and female of the same species, as I find *neither Cockerell nor Thorpe*, during their trip at Cape York, ascertained the sexes of the birds they shot, *by dissection*: I have made particular inquiries of Mr. Thorpe on this point; and I regret to say my collector at Rockingham Bay, when he skinned my specimens, made the same mistake, and went solely by the plumage; in the same locality were shot specimens of *M. lamberti*. It is not improbable that Mr. Gould's *Malurus hypoleucus* is quite a distinct species, or perhaps the young male of *M. amabilis*; but from the shape of the bill &c. I am at present inclined to believe it to be a distinct species; the fact that they associate together in troops proves nothing on this point.

97. *MALURUS LAMBERTI*.

I think Rockingham Bay must be the most northern limit of this species. The New South Wales birds differ in the tint of colouring from those from South Australia, being of a more verditer blue on the head, and of a lighter tint on the back.

98. *MALURUS MELANOCEPHALUS*.

Common everywhere from the Clarence river in New South Wales to Cape York.

99. *CISTICOLA RUFICEPS*.

This species is plentifully dispersed over the grass beds; it is common near Sydney, and equally plentiful at Cape York. The nest is a very neat, dome-shaped structure, chiefly composed of fine grasses, thistle-down, and cobweb, or the flowering portions of

grasses all matted closely and thickly together, and having the adjacent leaves of the plant in which it is placed neatly sewed on to the side of the nest; sometimes two or three broad leaves are sewed together with cobweb, and the nest made between them. The eggs are about the size of those of *Sericornis brevirostris*, of a delicate blue, spotted rather largely with reddish brown; they are three in number. The nest is always placed near the ground where the grass growing through some broad-leaved plant affords it concealment.

100. *SERICORNIS CITREOGULARIS*.

101. *SERICORNIS MAGNIROSTRIS*.

Both species plentiful in the dense scrubs; their large pendent nests hang like masses of moss-grown débris from almost every tree in certain parts.

102. *GEOBASILEUS CHRYSORRHOUS*.

I met with this species about 50 miles inland from Cardwell. There were also several *Acanthizæ* twittering in the scrub close by; but I had no opportunity of determining the species.

103. *ANTHUS AUSTRALIS*.

Always abundant in similar situations to those it frequents in New South Wales.

104. *SPHENÆACUS GALACTOTES*.

This species is one of the most common grass-birds; universally dispersed over the whole of Queensland.

105. *CALAMOHERPE AUSTRALIS*.

Found only on one occasion in tall reeds while we were shooting wild Geese (*Anseranas melanoleucus*); the note being exactly the same as that of the New-South-Wales bird, I presume it was the same species. Did not shoot any specimens.

105\*. *MIRAFRA HORSFIELDII*.

I found this species frequenting the dry parts of the grass beds all over the district of the Herbert river.

106. *ÆGINTHA TEMPORALIS*.

This species appears to be very rare about Cardwell. I met with only one small troop at Dalrymple's Gap, on the road to the Lower Herbert river.

107. *NEOCHMIA PHAËTON*.

The most common species from Rockhampton north to Cardwell.

108. *DONACOLA CASTANEOTHORAX*.

This and the preceding two species are the only ones I met with near

Cardwell. *Poephila gouldiæ* was described to me very correctly, and said to have been met with on the tablelands about 30 miles from Waterview; I did not find any specimens myself.

109. *PITTA STREPITANS*, var. *SIMILLIMA*.

This northern variety of *Pitta strepitans* I found common enough at the Herbert river and scrubs around Cardwell. Some of the specimens are deeper-coloured and smaller even than any I have seen from Cape York; others, again, are not to be distinguished from the New-South-Wales birds; the white spot on the wing is almost obsolete in many from the ranges near Cardwell. Their notes are exactly the same in all localities. The nest and eggs are the same, and are found to vary in the same way as those described and figured by me in 'The Ibis,' 1867, p. 417. In size they are slightly smaller. I believe the finely spotted variety of the eggs of this species, taken at Cape York by Cockerell and Thorpe, was at the time mistaken for the eggs of *Pitta mackloti*—which is very probable. One thing is certain, I never knew a nest of either *Pitta strepitans* or *P. simillima* to contain more than *three eggs alike*; and most often two out of the four (*the number invariably laid for a sitting*) have been of the finely spotted and light-coloured variety, the other two strongly and deeply marked, as figured in 'The Ibis,' 1867, p. 417.

110. *OREOCINCLA LUNULATA*.

I only once met with this species, in the scrubs on rocky sides of the coast-range; the eggs elongate, greenish, spotted with reddish brown, four in number.

111. *ÆLURÆDUS MACULOSUS*, Ramsay, P. Z. S. 1874, p. 601.

This interesting species appears to take the place of the *Æ. smithii* of New South Wales. We found it feeding on the fruit of the native figs, in small families of four to eight in number. The note is more of a *whistle* than a *cry* of any kind.

112. *SCENOPEUS DENTIROSTRIS*, gen. et sp. nov.

The whole of the upper surface, wings, and tail rich olive-brown, the inner webs of the primaries and secondaries blackish brown, their margins near the base buffy white; under surface of the shoulders yellowish buff, with remains of broken bars of blackish brown on the smaller feathers; the under wing-coverts yellowish buff, with cross bars of dull brown; under primary-coverts buff, crossed more distinctly with dull brown; under surface of primaries and secondaries dark ashy brown, the basal half of the inner margin buff tinged with a faint wash of light rufous, flanks olive-buff; abdomen buff; under tail-coverts olive-buff, each feather barred with two or more lanceolate marks of dull olive-brown, under surface of the tail dull brown; throat, neck below, chest, and the rest of the under surface buffy white, each feather margined with olive-brown, which becomes lighter and less distinct on the lower parts, and almost obsolete on the flanks

and abdomen; on the throat and chest the margins are almost black, and tinged with yellowish olive on the sides of the neck and chest, and the buff central portion of a deeper tint; the under surface has the appearance of being broadly streaked with lanceolate marks of buff, which become more and more indistinct as they approach the under tail-coverts, becoming obsolete on the abdomen.

Total length 11 inches; wing 5·7; tail 4; tibia 2·2; tarsus 1·2; hind toe 0·6, its claw 0·4, its width 0·25; inner toe 0·65, its claw 0·3; middle toe 0·9, its claw 0·35; outer toe 0·7, its claw 0·3; width of the sole of the foot 0·35; bill from gape 1·2, from forehead 1·1, from the nostril 0·6, height at nostril 0·6, width at nostril 0·5, culmen 1·1; upper mandible black, lighter at the tip; lower mandible blackish brown; gape yellow; legs and feet black, claws brown.

*Note.*—The cheeks and sides of the face and the ear-coverts have a rufous tinge, which may be from blood-stains; the greater portion of the breast and abdomen having been shot away, it is almost impossible to describe these parts accurately. The only specimens procured were shot by Inspector Johnstone, of Cardwell, with his rifle, and were consequently much damaged.

*Hab.* Bellenden-Ker range and the dense brushes clothing the steep sides of "Sea-view range" on the north-east coast of Queensland.

This species is not as yet known to build a bower; but like the Catbirds it clears a large space under the brushwood some 9 or 10 feet in diameter, and ornaments the cleared part with tufts and little heaps of gaily tinted leaves and young shoots.

This bird, which cannot be placed in any of the known genera of the family of Bower-birds, nevertheless approaches *Æluroedus*; it differs, however, from that genus in the following particulars:—The head itself is more elongated, the forehead flattish, broad, sloping very gradually from the bill, which is short and thick, much swollen at the sides; culmen much curved to the tip, which is blunt and strongly toothed; the inner margin also is toothed, having three distinct indentations (*hidden by the outer margin*) for the teeth of the lower mandible to fit into; lower mandible with one terminal and two lateral teeth on the margin on either side; nostrils basal, sunk, large, circular; the culmen just over these is compressed laterally; they are not hidden, although the bill is thickly clothed with feathers at the base; a few black short bristles over the nostrils; bill, measuring from its extreme base on the forehead, nearly the full length of the head; wings moderate, quills elongate, narrow, all more or less rounded; the secondaries squarish at the tips, being of a nearly equal breadth throughout; tail short, square, of twelve feathers, nearly all equal in length, the under coverts reaching to about the middle of the tail; tarsi short, about half the length of the tibia\*; feet comparatively small, hind toe connected to inner toe at the base by interdigital membrane, its sole broad; outer toe connected to middle toe as far as first joint, toes short; outer and inner

\* One tenth of an inch longer than *half* the tibia.



about equal in length, middle toe about one third longer; hind toe shortest and broadest at base; claws of all weak, curved, and compressed laterally. The plumage resembles that of the Catbird *Ælurædus*, being loose and comparatively long.

113. *MIMETA AFFINIS*.

114. *MIMETA VIRIDIS*.

115. *MIMETA FLAVOCINCTA*.

The first of these species is the most common; the two others I did not find to be plentiful.

116. *SPHECOTHERES MAXILLARIS*.

Plentiful everywhere on the margins of the scrubs.

117. *SPHECOTHERES FLAVIVENTRIS*.

I noticed several in a collection of birds made in the district, but did not perceive any specimens myself at Cardwell.

118. *CORCORAX MELANORHAMPHUS*.

Met with once or twice inland in open forest country.

119. *CORVUS AUSTRALIS*.

Common about the slaughtering-yards throughout the district.

120. *CALORNIS METALLICA*.

One of the most common birds in the scrubs of the Herbert river. They breed in companies, seemingly all through the year, making large bulky nests of grass and fine twigs with a side opening, which hang from the ends of the leafy boughs in clusters or singly; at times the branches break off with the weight of the nests and their contents. On the Herbert I noticed they gave preference to a small-leaved species of fig resembling *Ficus syringifolia*; and before a colony began to build, the twigs on many of the branches were broken and began to wither, and, hanging down, at a distance resembled in colour the brown nests of this species. I noticed this on two occasions, and remarked to Inspector Johnstone that the birds were building near his camp. However, when examining the tree through our field-glasses, we found nothing but bunches of dry leaves swinging about with the wind. A few days afterwards we noticed a neighbouring fig-tree in a similar condition; and as both trees were resorted to by these birds, I was under the impression that it was caused by the ravages of some insect which the birds came to feed on; however, about a month afterwards, Mr. Johnstone informed me that these trees had been taken possession of by colonies of Weaverbirds (or "Starlings," as they are called in those parts); and this bulk of brown nests was forming quite a new feature in the landscape.

The surface of the ground under a tree which has been colonized for some time is perfectly green with thousands of seedling plants,

which have sprung from the fruits brought by these birds for their young.

The food of this species is chiefly, if not exclusively, fruit of various kinds, including the seeds of several species of palms, particularly those of *Ptychosperma alexandræ* and *Kentia wendtlundtiana*; but although four species of *Calamus* with edible subacid fruits abound, I never found that these birds fed upon them.

The eggs are from three to four in number, variable in form, some roundish, others elongate, about the size of those of *Sturnus vulgaris*, of a greenish white, with bright reddish brown spots and dots, more numerous at the larger end.

121. POMATOSTOMUS SUPERCILIOSUS.

122. POMATOSTOMUS TEMPORALIS.

I only met with these birds on the western side of the coast-range, in open forest and thinly timbered country.

123. GLYCIPHILA FASCIATA.

This species is plentifully distributed over the coast-country from Port Denison to Cooktown. In habits and actions they resemble *Ptilotis flava* and others.

124. GLYCIPHILA SUBFASCIATA, Ramsay, P. Z. S. 1868, p. 385.

This species, although possessing nothing in its sombre plumage to recommend it, is certainly very interesting on account of its peculiarly shaped nest, being the only one of the Australian Meliphaginæ that I have met with which constructs a dome-shaped nest. It is a neat structure, composed of strips of bark, spiders' webs, and grass, and lined with fine grasses &c. The opening at the side is rather large; but the nest itself is rather deep, being about 4 inches long and  $2\frac{1}{2}$  to 3 inches wide. The eggs I did not obtain; but one taken from the oviduct of a bird is 0.75 inch in length and 0.5 in breadth, pure white, with a few dots of black sprinkled over the larger end.

The nests were invariably placed among the drooping branches of a species of *Acacia* always overhanging some creek or running water. All the nests I found were so situated; and my young friend Master I. Sheridan of Cardwell, who has paid considerable attention to objects of natural history, assures me that he has never found them otherwise; and the usual number of eggs for a sitting are two, and frequently without any black dots on the surface.

Their note is a sharp, shrill, monotonous cry, oft repeated at intervals; iris reddish brown.

125. STIGMATOPS SUBOCULARIS.

This species seems plentiful, inhabiting the mangroves and margins of the scrubs on the water's edge. They betake themselves to almost any of the forest trees when they are in bloom, attracted by

the honey and insects. In the neighbourhood of Sydney they frequent the orange-groves, and occasionally breed among the branches during the months of October and November. Their cry is peculiar, but not unpleasant, and at times varied.

126. *PTILOTIS LEWINII*.

This species is universally dispersed over the whole of the coast-country from the Hunter river to Cooktown. It is particularly fond of extracting honey from the flowers of the plantains and native bananas (*Musa banksii*, Müller). Banana groves abound in the Cardwell district, and may be distinguished at a great distance in large patches clothing the sides of the mountains on the sea-coast; and here this species is one of the most common birds. The nest is like that of *P. chrysops*, cup-shaped, open at the top, slung by the sides or rim between the twigs of some leafy bough or vine; it is composed of shreds of bark and grasses, webs of spiders, &c., and lined with similar material of a finer texture, or occasionally, when found in the neighbourhood of dwellings, with feathers, wool, or other soft substances. The eggs are two in number, pearly white, with deep-reddish dots.

127. *PTILOTIS VERSICOLOR*.

I only met with one specimen of this bird, which I obtained from Broadbent, who informed me the species was not scarce and usually fed among the blossoms of tall *Eucalypti*.

128. *PTILOTIS MACLEAYANA*, Ramsay, P. L. S. of N. S. W. pt. i. p. 10 (1875).

This fine species is one I mentioned in the P. Z. S. 1868, p. 386, under the name of *Ptilotis versicolor* of Gould (Handb. B. Austr. i. p. 506); and, strange to say, even the fully adult birds show that peculiarity in the plumage which is usually characteristic of immaturity. At first I considered them all young *P. versicolor*; but after having obtained and examined, from several sources, extending over a period of six years, numerous fine specimens, all in similar plumage, and shot at various times through the year, I felt convinced that they belonged to a distinct species; and on comparing them with Mr. Gould's excellent plates, I have no doubt I am correct.

The species has not a very extensive range, being confined, as far as we yet know, to the coast-range from the Herbert river north to Cooktown on the Endeavour. I found them nowhere plentiful, and always of a shy and retiring disposition. The sexes are alike in plumage.

The only note I heard them utter is a simple feeble cry resembling that of *P. chrysops*, but not so loud; in their actions and retiring disposition they resemble more *P. lewinii*.

129. *PTILOTIS FASCIOGULARIS*.

I find no mention in my note-book of meeting with this bird at Rockingham Bay; but I found it plentiful on an island off Port

Denison and near Cleveland Bay, about 60 miles due south of Rockingham Bay. They frequent the mangroves, and are to be met with in considerable numbers on many of the islands and mangrove-swamps along the shores of various bays as far south as Moreton Bay. They congregate in considerable numbers, and are very pugnacious at times, fighting among themselves and chattering as the yellow-tufted Honey-eaters (*P. auricomis*) are wont to do. I never met with them away from the margins of the salt water.

130. *PTILOTIS FRENATA*, Ramsay, P. Z. S. 1874, p. 603.

A very distinct and interesting species, procured near the township of Cardwell, feeding among the blossoms of the *Eucalypti*. It appears to be very scarce, only three being observed during our stay of six months.

131. *PTILOTIS FLAVA*.

A very beautiful species, and perhaps the most common bird about Cardwell; frequently seen clinging to the flowers of the bananas and plantains in cultivation round the houses: when among the blossoms of the *Acaciae* they are scarcely discernible, so closely does their yellow plumage match the tint of the blossoms.

132. *PTILOTIS PENICILLATA*.

133. *PTILOTIS FUSCA*.

I found these species frequenting the margins of creeks and rivers on the Upper Herbert, and about 50 miles inland from the coast. I did not notice them near the Bay.

134. *PTILOTIS CHRYSOPS*.

Common everywhere along the coast.

135. *PTILOTIS FILIGERA*.

This seems to be a scarce species and very local, although dispersed over a wide area. I obtained one only at Rockingham Bay; and one I received from Cape York.

136. *PLECTORHYNCHA LANCEOLATA*.

Although I was not fortunate enough to meet with this fine species myself, I saw some fine specimens which had been procured some 60 miles inland. This species appears to confine itself to the west of the coast-range, and is met with occasionally about the heads of the Burnett river.

137. *MELIPHAGA PHRYGIA*.

Once found in open forest-country near heads of the Upper Herbert river, 50 miles inland.

138. *TROPIDORHYNCHUS CORNICULATUS*.

Universally dispersed over the whole country as far north as Cardwell.

139. *TROPIDORHYNCHUS CITREOGULARIS*.

Equally plentiful with the last mentioned, but confined to the more inland parts and open forest-country. The nest is smaller, but similar in form and shape, and placed in like situations to that chosen by *T. corniculatus*; and like that species it builds its nest of strips of bark, and lines it with grass and finer shreds of bark. It is usually suspended by the brim from a horizontal bough, and frequently overhanging the water. An egg given to me some time ago, and said to belong to this species, is creamy white with blackish dots, in form somewhat elongated.

140. *MYZOMELA SANGUINOLENTA*.

During the months of April and May 1874 this bird was found by no means rare, feeding among the blossoms of *Lophostemon*, *Melaleuca*, and *Eucalyptus* in the neighbourhood of Cardwell and on the Herbert river. They arrive about Sydney during the months of October and November, and, remaining, breed during November, December, and as late as January.

141. *MYZOMELA PECTORALIS*?

One specimen only obtained, which I believe to be the young of this species: should it prove otherwise, it will be hereafter described.

142. *MYZOMELA OBSCURA*.

A very common species about Port Mackay and Port Denison, but did not appear to be so numerous about Cardwell; several specimens obtained. I have seen it as far south as the Mary river, where, however, it is very rare.

143. *ENTOMYZA CYANOTIS*?

While in the open forest-country near the heads of the Herbert river I met with species of *Entomyza* on several occasions, but regret we did not shoot any, having nothing smaller than a revolver in the shape of firearms with us. I am not by any means sure that the species was *E. cyanotis*, and am more inclined to consider it *E. albipennis*.

144. *MELITHREPTUS ALBOGULARIS*.

Common all along the coast-line, and for a considerable distance inland, from Brisbane to Cooktown.

145. *MELITHREPTUS GULARIS*.

This species appears to be plentiful, but not in the immediate vicinity of the coast. It is not rare about Maryborough, and is also found on the Upper Herbert. It has considerable powers of song, which may be heard often at daylight in the morning.

While camped on the banks of the Gregory a pair of these birds frequented a Wattle-tree (*Acacia*) near to our "tent" (a sheet of bark!), and delighted us every morning for many days by pouring

out their varied and pleasing song, which often lasted for ten or fifteen minutes without ceasing. I have since heard their song under more comfortable circumstances; and my brother and I at once recognized our old friends.

The nest and eggs are similar but slightly larger than those of *M. lunulatus*; eggs two in number, pale salmon-pink with deep reddish salmon dots on the larger end; the nest is cup-shaped, slung by the rim between twigs at the end of a leafy bough, and composed of fine grasses and strips of bark webbed together with spider's nests.

#### 146. *DICÆUM HIRUNDINACEUM.*

This species seems dispersed over the whole of Australia; nevertheless it is a bird seldom met with in collections, which may be accounted for by its habit of resorting to the highest trees. I found that both in Queensland and New South Wales they frequent the large clumps of mistletoe and *Loranthus*, of the fruit of which they seem to be particularly fond; at times they enter the gardens and feed on the fruits of the Cape-mulberry (*Morus*, sp.). An *Ehretia hottentotica* at Dobroyde, when its berries are ripe, is a favourite place of resort for this species.

#### 147. *NECTARINIA AUSTRALIS.*

I only met with this interesting species on one occasion near Cardwell; it is by no means common in that district.

#### 148. *ZOSTEROPS CÆRULESCENS.*

The Queensland specimens of this species are frequently smaller than our New-South-Wales birds, and often of a brighter tint on the head and throat, the silver ring round the eye is comparatively larger and more conspicuous.

#### 149. *PTILORHIS PARADISEA.*

The most northerly point that I met with this species was at Port Mackay on the Pioneer river; it was considered there a very rare bird. I have heard of its being occasionally met with in the ranges near Gympie.

This bird is very similar to *Climacteris* in its actions. While encamped for some three or four months in the ranges of the North Richmond river, the great stronghold of this species, I had abundant opportunities of studying its habits, and was struck with the similarity of its actions to our Tree-creepers. The young males and females, seldom accompanied by more than one adult male in livery, are frequently met with together traversing the stems and thick branches of the trees, especially those showing signs or in a state of decay.

The call-note of the adult male is a shrill scream, easily imitated sufficiently to attract its attention and cause it to remain until you approach. By this means I have frequently watched it closely as it hopped round the bole of some decaying tree, or tore off the loose bark in search of insects.

Seldom more than one adult male is found to every quarter of a square mile of scrub; and so little do they wander about, that it was customary for me to return to the same locality day after day until I had shot the bird, being quite sure of hearing him calling if he had not been destroyed in the mean time. These old males are usually solitary; but two or more occasionally meet in some favourite feeding-tree, when a fight is sure to ensue; for, although closely resembling the *Climacteris* in their actions, they differ in this respect, that they may occasionally be found feeding on the fruit of the native tamarind (*Tamarindus australis*).

The natives informed me that the Rifle-bird lays its eggs, which are white, in the hollow branch of a tree without making any nest whatever—which is not improbable.

#### 150. PTILORHIS VICTORIÆ.

The great stronghold of this species is the Bernard Islands north-east of Cardwell, a short distance from the coast. It is at times found on Hinchinbrook Islands, seldom on Gould and Dunk Islands, but not unfrequently in the dense scrubs clothing the coast-range near Cardwell. Once only did I meet with it on the Herbert river.

Their note and habits closely resemble those of *P. paradisea*. They were in full moult during the time of my visit, February and March, and did not regain their livery until May.

#### 151. CLIMACTERIS SCANDENS.

Not scarce in the open forest-land on the banks of the Upper Herbert river.

#### 152. CLIMACTERIS LEUCOPHÆA.

Met with on one or two occasions on the margins of scrubs on the Herbert river &c.

#### 153. ORTHONYX SPALDINGI, Ramsay, P. Z. S. 1868, p. 386.

In habits and actions this fine species closely assimilates to *O. spinicauda*, but is far more retiring and shy, much more noisy, and may be heard more frequently than seen. The young attains the adult plumage after the first moult, which takes place about December. They breed in September and October; and I believe the young then hatched moult in February and March, judging from a very fine series of skins I then procured.

This species has the habit of scratching up the dead leaves, and throwing the débris far behind it, after the manner of the "Scrub-hens" (*Megapodius tumulus*). Its powers of mimicry are very great; and, like the Lyre-birds, it seems capable of imitating almost any sound. These birds are not only rare, but at all times very difficult to obtain, and appear to be confined to the thickly timbered scrubs on the steep and rugged sides of the coast-range near Cardwell.

#### 154. SITTELLA STRIATA, Gould, Suppl. B. Aust. pl. 54.

I mentioned this species as the young of *S. leucoptera* in P. Z. S.

1868, p. 387, where a mistake in the description occurs, the words *upper surface* should have been *under surface*, as the text will show. It is plentifully distributed over the whole Rockingham-Bay district, and regarded by the aborigines there as sacred and as having had something to do with their first coming to that part of the country. This species seems to be more active than other *Sittellæ* I have met with. They are usually found in small troops, and seem in a hurry; hopping quickly over the trunks, stems, and branches of the trees, oftentimes head downwards, creeping round and round the limbs, stopping only to disengage some insect from the bark; and calling to each other in a mournful monotonous cry, they fly off to repeat the same actions on some other tree. They move along the forest at no mean pace, usually going in a direct line. The nest, like that of *S. chrysoptera*, is placed in an upright and usually dead fork of some high branch; it is made of fine strips of bark with a large quantity of spider's webs, with which small scales of bark resembling that of the branch in which it is placed are felted on so carefully as hardly to be detected even at a comparatively short distance; the rim is very thin, the nest open above and very deep.

155. *SITTELLA LEUCOCEPHALA*.

This very conspicuous species is far from being rare, and is usually met with in open forest country over the whole of northern Queensland as far as Cooktown. Its habits and actions and nidification do not differ materially from those of the other members of the genus. The notes of all closely resemble each other.

156. *CUCULUS CANOROIDES*.

This species was not rare at Cardwell during the months of March to May. I shot several of them in the moult and young plumage. They do not appear to me to differ much from the European *C. canorus*, either in the adult or in *any of the rufous-tinted immature stages of plumage*. I never heard them call. The young have a decidedly strong rufous tint pervading the upper surface.

157. *CACOMANTIS FLABELLIFORMIS*.

158. *CUCULUS*, sp. inc.\*

Both species common from September to May; the latter I find identical with a bird received from India.

159. *LAMPROCOCYX PLAGOSUS*.

160. *LAMPROCOCYX MINUTILLUS*.

Of the former, two specimens only were obtained, it does not appear to be very plentiful; of the latter species only one specimen was shot, near Cardwell. I obtained from the nest of a species of *Gerygone* an egg resembling that of *L. plagosus*, but much smaller, which, it is very probable, is that of *L. minutillus*.

\* I can find no description of this bird in any work.



## 161. SCYTHROPS NOVÆ-HOLLANDIÆ.

## 162. EUDYNAMIS FLINDERSI.

## 163. CENTROPUS PHASIANUS.

These species are all common enough throughout the whole district, the *Scythrops* usually met with flying about the tops of high trees in companies of five to eight in number; they have a loud harsh guttural croak, which is most usually heard early in the morning. The *Eudynamis* frequents fruit-bearing trees of every description, and feeds on numerous species of berries found in the scrubs, occasionally visiting gardens in the neighbourhood of the settlements for a like purpose. The Swamp-Pheasant, or Cookoo, as it is usually called (*Centropus phasianus*), is very numerous and may be always found frequenting the extensive grass-beds throughout the Colony. These birds prey on mice and small animals, holding them with their feet, and tearing them to pieces if they are too large. I once had a pair of *Centropus* in confinement; and although scarcely nine months old, they readily killed mice or young rats when let go in their cage: first picking them up quickly in their bill and rapping them smartly against the sides of the cage, they soon killed them; but often a peck on the back with their strong bills killed or disabled the animal at once. They eat raw meat, grasshoppers (*Locusta*), lizards, frogs, or bread readily; they appeared to be omnivorous, and became very tame in a short time.

## 164. CACATUA GALERITA.

This bird seems universally dispersed over the whole of Australia; and they are not one whit the less mischievous in the Cardwell district than any other. I found that they frequent the palm trees when the seeds are ripening; and there perched on the fruiting stems they amused themselves biting off the strings of red or green berries, and watching them as they fell to the ground. I have noticed them in New South Wales treating some of the flowering *Eucalypti* in the same way, and have frequently seen large trees with scarcely a bough untouched, and the whole ground underneath strewn with the leaves and branches. They seldom eat either the blossoms or the capsules of the *Eucalypti*, although they do feed on the palm- (*Ptychosperma alexandræ*) berries, and afterwards begin their work of destruction.

## -165. CALYPTORHYNCHUS BANKSII.

Not plentiful, one troop of five only met with on the Herbert river.

## 166. CALYPTORHYNCHUS LEACHII.

## 167. CALYPTORHYNCHUS FUNEREUS.

These seem to be the usual, but not common, species found about the Herbert river and Cardwell. I met them on two or three occasions, but found them very shy.

## 168. PTISTES ERYTHROPTERUS.

I found this species dispersed over the whole region from the Clarence river to the Cardwell district. Specimens of this species are smaller in size the further north they are found, until it reaches Cooktown and the Cape-York district, where they are the smallest, and the crimson on the shoulders of a deeper tint.

## 169. PLATYCERCUS CYANOGENYS.

Only once met with ; this species appears to be very rare in the Cardwell district, although I have seen several specimens from Cape York.

I found Parrots of all kinds very scarce, and especially the ground-Parrakeets and their allies. I did not meet with a single species of *Euphema* or *Psephotus*.

## 170. TRICHOGLOSSUS MULTICOLOR.

## 171. GLOSSOPSITTA PUSILLA.

## 172. GLOSSOPSITTA AUSTRALIS.

All three species very plentiful, and frequently met with feeding in the flowering *Eucalypti*.

I searched diligently for *T. rubritorquis*, but found no trace of it.

## 173. CYCLOPSITTA MACLEAYANA, Ramsay, Sydney Morning Herald Newspaper, Nov. 15, 1874.

This interesting and prettily marked species was discovered first by Mr. K. Broadbent near Cardwell, and found feeding on the native figs with which the scrubs abound. The specimens in the Dobroyde Collection are the only fully adult specimens obtained. I believe I forwarded to the Society a full description of the adults, male and female, and the young, several months ago\*. In case I should not have done so, I enclose a slip from the 'Sydney Morning Herald,' in which a portion of my notes appeared about the same time.

*Male.* Upper surface bright grass-green; forehead crimson bounded by a band of bright verditer blue, which extends through the lores, and, narrowing round the eye, reaches to the ear-coverts; from the base of the lower mandible, extending over the ear-coverts, an oblong patch of crimson, bounded below by a patch of deep blue; outer webs of primaries and secondaries deep blue; inner webs blackish brown; shoulders tinged with blue, under surface of the shoulders bright green, having a narrow band of yellow, formed by a series of spots of the larger under wing-coverts; across the centre of the wing a larger band of yellow, formed by a series of elongated marks on all but the second and third primaries; a longitudinal spot of red on the inner webs of the third and fourth tertiaries nearest the body; the remainder of the wings on the under surface blackish brown; whole of the under surface of the body bright

\* [This description was never received. The species appears to be the same as *C. maccoyi*, Gould, P. Z. S. 1875, p. 314, and Birds of New Guinea, pt. i. pl. 10.—P. L. S.]

green; on the sides of the breast, from under the wing, extending nearly to the flanks, is an oblong patch of bright yellow; under tail-coverts and flanks bright green, tipped with verditer; bill, tarsi, and feet dark-horn colour. Total length 5 inches, wings from flexure  $3\frac{3}{16}$ , tarsi  $\frac{7}{16}$ , tail  $1\frac{1}{2}$ ; bill from cere along the culmen  $\frac{9}{16}$ , width at base  $\frac{1}{2}$ .

*Female.* The female differs in having the whole of the sides of the face, from the base of the upper mandible to the ear-coverts, of a bright verditer blue; the outer and lower portions of the ear-coverts deep cobalt blue, and in having no trace of red on these parts. The spot on forehead just in front of the cere is of a duller and more of an orange-red than in the male; the breast and abdomen have a slight tinge of yellowish green.

*Hab.* Scrubs on coast-range near Cardwell, Rockingham Bay, Queensland.

*Young.* In the not quite adult birds the breast and under surface of the body is of a paler green, and has a decided yellow tinge. The cheeks are of a paler blue, and void of the red patch so conspicuous in the adult male. Bill pale horn-colour, darker at the tip.

*Remarks.* This very prettily marked species is the second of the genus *Cyclopsitta* now known to inhabit Australia; it is closely allied, although quite distinct from *C. coxeni*, Gould, being much smaller and more beautifully and distinctly marked about the face and head. The specimens now gracing the collection of William Macleay, Esq., M.L.A., of Elizabeth Bay, Sydney, those in the Australian Museum, and in the Dobroyde-Museum collection, from which the above descriptions have been jointly taken, were procured by Mr. K. Broadbent, taxidermist, during a collecting-tour in the neighbourhood of Cardwell. They were found feeding on the fruit of the native fig-trees, which abound in the dense scrubs and brushes clothing the margins of creeks and rivers at the foot of the coast-range. It is doubtless the northern representative of *Cyclopsitta coxeni*, which, I believe, has not been met with north of the Brisbane district.

### 3. Description of the Eggs and Young of *Rallina tricolor*, from Rockingham Bay, Queensland. By EDWARD P. RAMSAY, C.M.Z.S.

[Received August 24, 1875.]

I found this fine species of Rail by no means rare in the dense scrubs which fringe the rivers and creeks of the coast range near Rockingham Bay; but although tolerably plentiful, they are always very difficult to obtain, on account of the nature of the localities they frequent and their retiring disposition. They are seldom to be seen without lying in wait for them; and not always then can one obtain a shot, except, perhaps, at such close quarters as would entirely destroy them.

They move about more in the evenings and early morn, and at

night may be heard calling to one another as they traverse the dense masses of rank vegetation which abound in those districts. I never met them out of these scrubs, although thick swampy grass-beds close by were frequented by allied species.

They seem very local in their habits, a pair frequenting the same spot for months or perhaps the whole year round, and breeding near the same place year after year; the young soon begin to take care of themselves, and leave the parents before they are well able to fly. I found them some four or five months old in pairs.

The note resembles a hoarse croak quickly repeated in a somewhat mournful tone, and a quick "cluck cluck" when come upon suddenly. I was not fortunate enough to find the nest and eggs myself; but shortly after I left the Herbert river I received a fine set of these eggs from Inspector Robert Johnstone, to whom the bird is well known, and who assures me that after finding the nest and eggs he left it until he had twice seen the bird sitting thereon, that he might be perfectly sure there could be no mistake as to their identity.

I had informed Mr. Johnstone of my doubts as to the authenticity of the eggs mentioned by Mr. Gould, on the authority of Cockerell, who, I have been informed, did not actually take them himself, the eggs in question having been brought to his companion Mr. J. Thorpe by a black fellow. I have before me one of these *white* and so-called Rail's eggs, which I obtained from Mr. Thorpe on his return with Cockerell from Cape York, and can only say that it is remarkably like that of a *Pigeon* (!) in *every* respect.

The eggs forwarded by Inspector Johnstone, of the authenticity of which I have not the slightest doubt, have a pale cream or whitish ground-colour, sprinkled all over, but more thickly at the larger end of some, with irregular-shaped spots of light reddish chestnut, and a few of a lilac tinge appearing as if beneath the surface of the shell, having the characteristic form, markings, and colour of all true Rail's eggs. They are four in number, in length 1.5 to 1.6 inch, in breadth 1.07 to 1.1 inch. The nest was composed of a few leaves and grass, and hidden among thick débris at the root of a tree in a dense part of the scrub near Mr. Johnstone's camp. The young on leaving the egg are covered with a sooty-black down, having a dark plumbeous tinge on the under surface.

The young at about five months old have the upper surface of a dull dark brown tinged with olive and washed with light rufous brown on the back of the neck; the under surface is of a duller and more plumbeous brown, with a faint wash of rufous brown on the chest and under tail-coverts, which latter have two pale rufous bars on each feather; the under surface of the wings blackish dull brown, a band of white spots near the base, and a similar band about the middle of the quill-feathers; bill olive-brown; legs greenish olive; iris reddish brown. Total length 7 inches, wing 3.6, tail 1.5, tarsus 2 inches, bill .9.

4. Description of new Land and Freshwater Shells from  
India. By SYLVANUS HANLEY, F.L.S. &c.

[Received September 20, 1875.]

The first two of these fine shells were collected by W. Theobald, my coadjutor in the 'Conchologia Indica,' and have been figured, but not described, in that publication. As the specimens were unique, they have been retained for some years in the hope of obtaining other individuals; for the common practice of describing from single specimens should be avoided where practicable. The *Cyclophorus* has been delineated in the forthcoming final part of our joint work (pl. 144. f. 6), the *Ampullaria* in the preceding one (pl. 115. f. 2).

1. CYCLOPHORUS OPHIS, Hanl.

*T. depresso-turbiniformis, satis magna, late umbilicata, nitida, solidiuscula, lævigata, brunneo et albido concentricè undata vel nebulosa, ad basim albida, maculis parvis diversiformibus spirali-ter fasciata; spira satis elevata, apice livido. Anfractus valde convexi, 5½-6, superne paululum planiores, celeriter (ultimus præsertim) accrescentes; sutura simplex. Apertura alba, permagna, unice hians, suborbicularis, latior quam alta, infra basim porrecta: labium acutum, late reflexum, undique expansum.*

Lat. circiter 2 poll.

Hab. Tenasserim.

Mus. Theobald.

This remarkable-looking shell reminds one of *C. tuba* in shape, and *C. siamensis* in painting. Our specimen has an indistinct, interrupted, whitish peripheral fillet; and its surface exhibits, when magnified, some faint and close-set spiral wrinkles upon the upper portion of the final volution.

2. AMPULLARIA THEOBALDI, Hanl.

*T. magna, solida, globosa, nitida, sublævigata, rugis incrementi umbilicum magnum versus subplicata; flavo-olivacea, antice (præsertim) vittis brunneis, et plerumque angustis, ornata. Anfractus spiræ vix elevatæ, et sæpius erosæ, lati brevesque. Sutura profunda, in adultis subcanaliculata. Apertura elliptica; faux chocolati colore tincta; labium exterius albidum, seu flavescens, fusco-nigrescente subarticulatum; labium interius atrofusum.*

Long. et lat. 3½ poll.

Hab. Bhamao, Birmah (*Theobald*).

Mus. Hanley.

This magnificent shell is named in honour of my coadjutor in our illustrated Indian conchology, wherein it has been delineated. It has the general aspect of *A. zonata*, is broad in proportion to the height, and has apparently no fillets near its profound suture. The calcareous opercle is heavy, and within of a livid smoke-colour.

The specimen described seems old, though in fine condition; of course its characters will be modified in less-mature examples. I state this because I suspect that some young fragile shells from the Naga hills may prove identical.

### 3. ACHATINA (GLESSULA) SENATOR, Hanl.

*T. subovato-conoidea, nonnunquam angustior, tenuis, nitida, lævigata, chocolati colore tincta, vitta flavescens seu pallida conspicue ornata. Anfractus convexi, multo latiores quam alti (in exemplo imperfecto  $6\frac{1}{2}$ ), celeriter accrescentes, infra suturam valde impressam vitta perangusta, et supra suturam vitta lata (in anfractu ultimo paululum supra medium posita) picti. Spira circiter dimidium testæ occupans; apex pallidior, subito obtusus. Columella brevis, pallidior, subito obtusus. Columella brevis, pallida, arcuata, late truncata.*

Long. 1.

*Hab.* In Indiâ meridionali.

*Mus.* Beddome, M'Andrew.

Only four specimens are known to me, all from the Cottyam Hills: two are young and rather narrow in proportion to the fine but broken-lipped example I have described, which once belonged to the celebrated Indian conchologist W. Benson; it will be figured in the 'Conchologia Indica' (pl. 155. f. 4).

### 4. ACHATINA (GLESSULA) ISIS, Hanl.

*T. turrito-subcylindræa, lævis, tenuis, nitidissima, albida seu pallida, nonnunquam vitta angusta fulva, lineis perparvis fulvis confertis circumcincta: vitta variabilis seu sæpius versum basim anfractuum superiorum et supra medium anfr. ultimi posita. Anfractus circiter 10, convexi, sensim accrescentes, ad suturam profundam sub lente obsolete subcrenati, multo latiores (ultimo excepto) quam alti: apex obtusus. Apertura angusta, quartam partem totius altitudinis paululum superans. Columella brevis, arcuata, oblique contorto-truncata.*

Long.  $1\frac{1}{3}$  poll., lat.  $\frac{2}{7}$  poll.

*Hab.* Indiam meridionalem.

*Mus.* Hanley.

A figure of this will be found in the 'Conchologia Indica' (plate 155. f. 5). The hair-like lines and narrow fillet seem peculiar to the species: the fillet, however, is neither constant, nor fixed as to position.

### 5. UNIO VULCANUS, Hanl.

*T. solida, inæquilateralis, subovata, viridis, undique (nisi fortasse ad extremitatem anticam) plicato-rugosa; plicæ (seu tubercula elongata confluentia) undatim angulariter et oblique ordinatæ. Margo dorsalis posticus et margo ventralis convexi, subparalleli. Costa umbonalis nulla; area postica nequaquam concava. Lunula lata, haud multum impressa. Margarita alba, vix minime iridescens. Margo cardinalis latus; dentes cardinales solidi,*

*lacerati*; in valvula sinistra dens lateralis inter duos valvulæ dextræ insertus.

Long. 1 poll., lat.  $1\frac{1}{3}$  poll.

*Hab.* Birmah, vel Pegu.

*Mus.* Hanley.

The beaks are eroded in our only specimen of a shell (Conch. Indica, pl. 155. f. 3), which reminds us somewhat in structure of the *Unio tavoyensis* of Gould. When held before a light the valves appear of a yellowish green, richly embossed with zigzag ridges of a darker or bluer verdure. The hinge is nearly the same as in *U. favi-dens* of Benson, the central teeth being short and very complicated.

5. Further Observations on *Alcyoncellum speciosum*, Quoy et Gaimard, and *Hyalonema mirabile*, Gray. By J. S. BOWERBANK, LL.D., F.R.S., F.Z.S., &c.

[Received September 24, 1875.]

On Wednesday the 8th September, 1875, I received a jar of specimens from Commodore Parish, of Hong-Kong, which he stated he obtained from the 'Challenger' when there. The specimens were preserved in spirit in the condition in which they were taken from the sea. They consisted of two specimens of *Alcyoncellum speciosum* with their dermal membrane and sarcodous substance in a fine state of preservation, one fine specimen of *Hyalonema mirabile* with the basal sponge in fine condition and with its dermal membrane in perfect preservation, and a fine head of a recent pentacrinite with about three inches of its stem with side arms in a good state of preservation. These specimens, especially those of *Alcyoncellum speciosum* and *Hyalonema mirabile*, are exceedingly interesting, as their perfect state of preservation enables us to complete our knowledge of their anatomical peculiarities to a much greater extent than those, in a more or less imperfect condition, with which we have hitherto been acquainted. On mounting in Canada balsam small portions of the two specimens of *Alcyoncellum speciosum*, I found in a fragment from near the distal end of one of them the beautiful dermal expansile system of reticulated structure, composed of slender rectangulate sexradiate spicula, the distal ray of each terminated by a spinulo-quadrifurcate sexradiate stellate spiculum, which is so beautifully exhibited in the highly interesting skeleton of the specimen from a sponge of the same species presented to me by my friend Dr. Millar, and described by me in Part IV. of my "Monograph of the Siliceo-fibrous Sponges," in the Society's 'Proceedings' for 1875. The complete envelopment of these beautiful tissues by the dermal sarcodous of the specimens in a natural state renders the identification of these delicate defensive organs by no means an easy task; and in truth, without the indications of their forms and proportions afforded by Dr. Millar's specimens, we could scarcely have hoped to detect them *in situ* amidst the dense amber-coloured sarcodous in

which they are immersed. Their complete immersion in the sarcode immediately beneath the dermal membrane indicates in a very satisfactory manner their peculiar office as expansile portions of the dermal system, and as organs of defence for the preservation of that important portion of the structure of the sponge.

The specimen of *Hyalonema mirabile* is in a much finer state of preservation than any of those which I formerly examined, and described in the 'Proceedings' of this Society for 1867; and it has enabled me to complete the description of many parts of this extraordinary species of sponge, which the dilapidated condition of the specimens to which I then had access prevented me from determining with accuracy.

The total height of the specimen received from the 'Challenger' is sixteen and a half inches. The basal spongy portion is of a conical form, two inches in height; and the average diameter of the base of the cone is two and a half inches. It is a fortunate circumstance that the basal membrane and that of the upper or conical portion of the spongy mass are both in a perfect state of preservation. The basal portion of attachment is very sinuous and irregular, as if it had been adherent to an undulating surface which had been of somewhat soft consistence, so that it had been separated from it without the destruction of the basal membrane of the sponge. The apex of the spongy mass closely embraces the spiral column of the cloacal system; and the lower part of the spiral column is completely buried in the basal sponge. The corium, in a more or less perfect state, extends from the apex of the spongy cone for about seven inches of the remaining portion of the spiral column of spicula; the remainder of which is bare, but spirally twisted to very near its distal termination. The corium is studded with the usual mamilloid oscular organs; and none of them exhibited the slightest indication of polypiferous contents, which we should naturally have expected to find, had such parasitical creatures been present, in a living specimen fresh from the sea, as the one in course of description evidently was.

The adherent basal surface of the sponge has a distinctly marked boundary-line, consisting of a well-produced slightly compressed projecting ridge of membrane; and a difference of the structure of the basal and the upper portion of the dermal membrane is distinctly visible to the unassisted eye. This difference in their aspects arises from modifications in the reticular structures of the two parts to fit them for their respective offices.

When small portions of each of the parts of the membrane were mounted in Canada balsam, their differences in structure became strikingly evident. The same forms of spicula were to a greater or a less extent present in both, but the modes of their distribution and arrangement were very different. The rete of the basal portion is comparatively compact and strong, and closely approaching regularity. It is constructed with the long inflato-acerate spicula which are common to both parts of the membranous skeleton structure, but with a considerable mixture of large rectangulate sexradiate spicula, which



adds considerably to its strength; and the membranes of the areas are abundantly supplied with the minute quadrihamate defensive spicula, which are all disposed on the membrane on their flat surfaces. In the structure of the upper portion of the dermal membrane the rete is open and diffuse, and the areas assume an irregular elongate form; and the rete is composed only of large inflato-acerate spicula, without apparently any intermixture of the large rectangulate sex-radiate ones, which are of such common occurrence in the basal portion of the membrane. Another distinctive structural difference is, that the areas in the rete of the dermal membrane are furnished in a strikingly beautiful manner with the spinulate cruciform defensive spicula, which are abundantly disposed on all parts of the surface at nearly equal distances from each other in a manner closely approaching regularity; and nearly all of them are projected at right angles to the surface on which they are based. The minute quadrihamate spicula so abundant on the basal membrane are very rarely to be detected on the upper dermal one.

These structural modifications of the dermal membrane indicate the difference in the respective offices of the two parts of the animal in a very striking manner; but not to a greater extent than we may observe in many sessile British sponges under similar circumstances.

A minute description of these characters of the respective parts of the dermis of the sponge are especially necessary, as much misapprehension has existed in the minds of some naturalists as to the true position of *Hyalonema* in its natural locality, some having imagined that the pointed end was deeply plunged into the bottom of the sea, and that the sponge-mass was the distal termination of the animal.

In all sponges with which I am acquainted, the attachments are either adhesive, or clasping like the roots of Fuci, never penetrative like the roots of plants that derive nutriment from the soil, which sponges never do. The idea of the slender pointed distal termination of *Hyalonema* being plunged into the sea-bottom, and thus supporting a heavy mass of sponge at its opposite end, is contrary to all we really know of the usual habits of these animals in their natural localities. In corroboration of this opinion, I may state that amongst the various specimens of this species of sponge which I possess, I have one thirteen inches in length, the distal extremity of which for six inches of its length is completely enveloped by the corium, which has the usual mamilloid organs upon it up to the extreme apical termination. These organs, which have been supposed to be polyp-cells, would have been in a very strange position had they ever been immersed in the soft substance of the sea-bottom. In further elucidation of this subject, I may refer my readers to an article on *Hyalonema* in 'Land and Water,' for February 13, 1871, p. 219, written, I am informed, by a naval officer of the name of Templar. He writes:—"For Dr. Bowerbank's theory concerning *Hyalonema*, 'or the long glass-rope sponge,' and his belief in the siliceous spicula growing upwards, the sponge adhering to a rock, I have great respect as well as belief. His friend, Mr. Henry Lee, wrote to me when in Japan to try and discover 'if such was the case;' and from what I

could glean I found it was so. Two English gentlemen saw it brought up by divers from the bottom, who stated it grew sponge downward and spicula upwards. Upon stating this to an awful authority of the British Museum he said, 'Pshaw! Japanese always stuff up Europeans,' and added by way of proof, 'we hauled up some the other day in the Bay of Biscay with a hook and line, and the spongy stuff came up first, so it must be so.'"

6. On a Collection of Butterflies from the New Hebrides and Loyalty Islands, with Descriptions of new Species. By ARTHUR G. BUTLER, F.L.S., F.Z.S., &c.

[Received October 2, 1875.]

(Plate LXVII.)

It will be remembered that I published a list of the Butterflies of the South-Sea Islands in the 'Proceedings' for 1874, in which I enumerated 104 species, reported by various entomologists as occurring in that interesting region. In the present paper I propose to give a list of the species recently sent to the British Museum by our indefatigable correspondent W. Wykeham Perry, Esq., H.M.S. Pearl, as the result of a short cruise through the New Hebrides.

Mr. Perry writes, "We made such a hurried run through the group, that I had but a few hours to spend at each place which we visited, and therefore less opportunity than I had hoped to have of making a more varied collection."

Notwithstanding the short time in which the whole of the species were captured, they represent a most interesting and instructive consignment, not only as clearing up difficulties respecting some of the forms inserted with hesitation in my previous list, but because nearly half of them are new to science—one or two being, moreover, referable to genera which have ever been especial favourites with lepidopterists.

Fortunately, Mr. Perry has sent good series of several of the commoner species; so that their constancy is now firmly established, and all doubt of their being variations or sports of other Butterflies is at once set at rest.

The following is a list of the species.

1. *DANAIS PUMILA*, Boisduval.

Maré, Loyalty group, May 1875.

Previously only known from New Caledonia.

2. *DANAIS HEBRIDESIA*, n. sp. (Plate LXVII. fig. 6.)

♀. Allied to *D. pumila*, but considerably larger, the wings proportionally longer; primaries with the outer margin distinctly sub-angulated below the apex; basal yellow area rather paler; the sub-apical band more oblique, and consequently longer; secondaries with the upper discocellular scarcely perceptibly angulated; the





outer border broader, dark brown, becoming reddish on the margin; wings below paler, the discoidal cell of secondaries without any trace of longitudinal streaks: expanse of wings 2 inches 9 lines.

Aneiteum, New Hebrides, 22nd April 1875.

*Danais pumila* is a very constant and small species, measuring 2 inches 1–2 lines in expanse; the female has come in this collection; I therefore have no hesitation in considering the above insect from Aneiteum perfectly distinct.

3. *DANAIS MODERATA*, n. sp.

♀. Allied to *D. hamata*, from which it differs in the reddish basal costa of primaries, and in having all the subhyaline spots smaller, narrower, and paler in colour; wings below redder in tint: expanse of wings 3 inches 5 lines.

Vaté or Sandwich Island, New Hebrides, 28th April 1875.

*D. hamata* seems to have its representatives everywhere; whenever we receive an Indian or Indo-Australian collection, some form of it is almost sure to come. The following are now in the collection of the British Museum:—

1. *D. septentrionis*, from India; 2. *D. microsticta*, from Borneo; 3. *D. leucoptera*, New Guinea; 4. *D. hamata*, Australia; 5. *D. melittula*, Upolu; 6. *D. obscurata*, Solomon Islands; 7. *D. moderata*, Sandwich Islands.

4. *EUPLŒA HELCITA* ♀, Boisduval.

Erromango Island, New Hebrides, 10th May 1875,

5. *EUPLŒA LAPEYROUSII* ♂, Boisduval.

Havannah, Vaté or Sandwich Island, 30th April, 1875; Mota Island, New Hebrides, 5th May, 1875.

6. *EUPLŒA TORVINA*, n. sp.

♂. Nearly allied to the preceding, with the same elongated sericeous streak on upper surface of primaries, but slightly longer in the wing, altogether deeper in colour, and with the marginal area and anal angle of secondaries much less pale; no subapical diffused whitish streak in primaries; the same differences below, but much more evident, the costa of secondaries also nearly straight and the litura on first median interspace of primaries elongated into a streak: expanse of wings 3 inches 1 line.

Aneiteum, 22nd April, 1875.

7. *CALLIPLŒA IPHIANASSA* ♂, ♀, Butler.

Aneiteum, New Hebrides, 22nd April, 1875.

Two forms of this species occur, one having the submarginal spots of primaries large towards costa, the other having them small; this modification is found in both sexes.

8. *CALLIPLŒA SERIATA*? Herrich-Schäffer.

Maré, Loyalty group, May 1875.

One example is smaller than usual, and has lost most of the submarginal spots on under surface of secondaries : the description by Herrich-Schäffer is scarcely sufficiently explicit.

9. *CALLIPLŒA TULLIOLUS* ♀, Fabricius.

Erromango Island, New Hebrides, 10th May, 1875.

10. *MELANITIS TAITENSIS*, Felder.

Aneiteum, New Hebrides, 22nd April, 1875 ; Tanna, 23rd April 1875.

11. *MELANITIS SOLANDRA*, Fabricius.

Tanna, New Hebrides, 23rd April, 1875 ; Vaté or Sandwich, 30th April, 1875.

Four examples of this form, exhibiting no variation on the upper surface of the wings.

12. *MYCALESIS MUTATA*, n. sp.

Nearly allied to *M. hesione*, but deeper in colour, and with the ocelli below separated by a space from the central white streak and touching the submarginal lines : expanse of wings 1 inch 9 lines to 2 inches.

Erromango, New Hebrides, 10th May, 1875.

This is the first species of this genus hitherto recorded from the South Seas ; in marking it nearly approaches *M. cinerea* : Mr. Perry remarks respecting it, "saw but few of these in Erromango, and none in any other island."

13. *MYCALESIS LUGENS*, n. sp.

Allied to *M. lalassis* ; ocelloid spot on upper surface of primaries scarcely visible : wings below dull sepia brown, crossed at the middle by a slightly irregular, continuous, slender, black-edged, whitish line ; primaries with four ocelli (the first two placed obliquely, the fourth largest), black, white-pupilled, with dull ochraceous irides and brown zones enclosed by a pale brown line ; a rather wide sinuated marginal area pale brown, intersected by a blackish line : margin black ; fringe pale brown ; secondaries with seven ocelli, (the first and fifth largest, the second and third smallest), similar to those of primaries, but brighter in colour, marginal area as in primaries ; body greyish brown : expanse of wings 1 inch 8 lines.

Vaté or Sandwich Island, New Hebrides, 28th April, 1875.

This is most like the Bornean form of the series generally referred to *M. lalassis* ; the latter requires examination, as it clearly represents several well-marked species.

14. *DOLESCHALLIA HERRICHII*, n. sp.

*Doleschallia bisaltide*, Herrich-Schäffer (nec Cramer).

This species, as I supposed, differs considerably from *D. bisaltide*, as follows—primaries much less falcated, the black area deeper in colour and covering half the wing, the marginal area being much

broader; short ochreous fascia beyond end of cell narrower and deeper in colour; the spot which follows it (at the end of the subapical series of white spots) white or nearly white, and placed further off; secondaries shorter, with the dark spots and submarginal lines blacker; below, all the markings brighter and better defined, the silvery spots present in the male, which is generally more deeply coloured, whilst the female is paler in tint than *D. bisaltide*: expanse of wings 2 inches 10 lines to 3 inches.

Erromango Island, New Hebrides, May 1875.

15. *DOLESCHALLIA MONTROUZIERI*, n. sp.

*Nymphalis polibete*, Montrouzier (nec Cramer).

Above very like the preceding species, but much smaller, the lower black spot of secondaries with a lilacine pupil; below much like *D. polibete*, but duller in colour, with the ocelli proportionally larger and better defined: expanse of wings 2 inches 5 lines.

Vanua Levu, New Hebrides, 6th May, 1875.

This species cannot be mistaken for *D. polibete*, the upperside being altogether brighter in colouring, with the black-brown area much more sharply defined as in *D. bisaltide*. It seems that I did not go far enough in my anticipations with regard to *Doleschallia*; I expected only to see one new form from the South Seas, whereas two have been discovered.

16. *CHARAXES CLITARCHUS* \*, Hewitson.

Maré, Loyalty group, May 1875.

This scarce and beautiful species has hitherto been unique in Mr. Hewitson's collection from New Caledonia; our example is rather larger, and has the primaries slightly more falcated than the type; it also differs, in several unimportant points, in pattern and coloration.

17. *DIADEMA NERINA*, var. Fabricius.

Erromango, New Hebrides, 10th May, 1875.

One example of a handsome variety of *D. nerina*, in bad condition; it approaches *D. proserpina* in colouring, but has the oblique subapical band of primaries clouded with fulvous.

18. *DIADEMA PERRYI*, n. sp. (Plate LXVII. fig. 3.)

Size and form of *D. montrouzieri*: general character of pattern as in *D. pandarus*.

♂. Wings above deep brown; several streaks across the cell, a broad oblique postmedian diffused band, and two submarginal undulated bands separated only by a black line, pale brown; a bifid subapical costal spot placed obliquely on the subcostal branches, and six rounded discal spots parallel to the margin, all white with a narrow lilacine edging; secondaries with the discal area from just beyond the cell abruptly paler, becoming tawny ochreous externally, and bounded near the outer margin by a series of ochreous lunulated

\* Exot. Butt. V. *Char.* pl. iv. figs. 16, 17 (Oct. 1873).

spots; centre of discal area traversed by eight violaceous ocellated spots with white pupils and black margins; outer margin dark brown intersected by a lunated paler brown line; fringe white-spotted: body black-brown: wings below paler than above, all the markings lighter, the discal spots larger, pale blue with white centres and black edges: body brown, legs and palpi streaked with white: expanse of wings 3 inches 11 lines.

♀ paler than the male, the lighter parts especially; postmedian band of primaries sordid white; ocelli smaller: expanse of wings 3 inches 11 lines.

Erromango, New Hebrides, 10th May, 1875.

This is one of the finest species that has hitherto come from the South Seas.

19. *ATELLA BODENIA*, M. R. Butler.

Maré, Loyalty group, May 1875.

Much darker than the type from the Friendly Islands, and consequently more like *A. egista*, but smaller and darker; I am now satisfied that I was right in considering the *A. egista* of Herrich-Schäffer synonymous with *A. bodenia*.

20. *LAMPIDES PLATISSA*, Herrich-Schäffer.

Erromango, New Hebrides, May 10th, 1875; Maré, Loyalty group, May 1875.

This species seems to be very common.

21. *LAMPIDES SAMOA*, Herrich-Schäffer.

Erromango, New Hebrides, May 1875.

This species seems to me to be the *L. caledonica* of Felder.

22. *LAMPIDES ARMILLATA*, n. sp.

♂. Above copper-brown with violet reflections; base blackish with blue reflections; marginal edge black; fringe grey; secondaries with two subanal black spots bordered with yellowish brown; body blackish clothed with grey hairs; palpi white at the sides; antennæ white spotted with black above, club black above, tawny below: wings below stone-colour; primaries with a spot at end of cell, a slightly curved series across the disk, and a very indistinct marginal series whity brown bordered with reddish brown and whitish; secondaries greyer than primaries, speckled with black at base; a spot at end of cell, a series all round it, and an indistinct marginal series drab margined with dark brown and white; marginal series in both wings with central brown spots; anal black spots spotted with brilliant silver and bordered with straw-yellow: body grey, speckled with black: expanse of wings 9 lines.

Vaté or Sandwich Island, New Hebrides, 24th and 28th April, 1875.

23. *LAMPIDES DEPLORANS*, n. sp.

Allied to the preceding. Wings above dark grey, becoming



blackish at the extremities; secondaries with two indistinct black subanal spots; body black: wings below pale grey; primaries with outer margin broadly brown, diffused internally; a spot at end of cell and an irregular transverse discal series grey, outlined with dark brown and white; secondaries with a constricted spot at end of cell enclosed by a double series of spots grey, outlined with dark brown and white; a discal series of lunules parallel to the margin and enclosing a submarginal series of spots, the three nearest to anal angle large, black, speckled with metallic steel-coloured scales; extreme margin black, fringe brown, varied with sordid white; body grey: expanse of wings 11 lines.

Maré, Loyalty group, May 1875.

I was at first inclined to consider this the female of the preceding species; but the outline bands of the underside do not quite agree, and there are three instead of two metallic speckled spots in secondaries; these differences, taking the different habitat into consideration seem to indicate a distinct species.

24. *LAMPIDES CARISSIMA*, n. sp. (Plate LXVII. figs. 4, 5.)

Allied to *L. candrena*. ♂. Bright Morpho-blue, with the outer margin narrowly black; secondaries with two linear subanal black spots; abdominal margin brown; tail black, tipped with white; body blackish grey; collar white behind the eyes; frons with two cream-coloured lines; palpi white below; antennæ black, annulated with white below: wings below drab, with whitish-edged bands as in *L. candrena*; secondaries with two subanal black spots, speckled with pale metallic-blue scales and bordered above by orange lunules; body greyish at the sides, white below: expanse of wings 1 inch 2 lines.

♀. Above paler blue, with broad blackish grey borders along the costæ and outer margins; secondaries with a submarginal series of blue-edged black spots; abdominal margin brown; body grey, thorax bluish, head as in the male; underside nearly as in the male, but paler, all the markings well defined, edged with white: expanse of wings 1 inch  $1\frac{1}{2}$  line.

Erromaugo, New Hebrides, May 10th, 1875.

We have this species in the collection of the British Museum from the Navigators' Islands.

25. *LAMPIDES CANDRENA*, Herrich-Schäffer.

Tanna, New Hebrides, 23rd April, 1875.

This and the preceding are two of the most beautiful of the small blue butterflies; they belong to the *L.-democritus* group.

26. *LAMPIDES EVANESCENS*, n. sp.

♂, ♀. Allied to *L. celianus*, from which it differs in the slightly shorter wings and broader black border to primaries above, the more distinct marginal spots of secondaries, the greyer tint of the underside, with narrower and somewhat differently arranged transverse white bands; subanal black spots of secondaries smaller, with larger

orange zone : expanse of wings, ♂ 1 inch 2 to 4 lines, ♀ 1 inch to 1 inch 4 lines.

Erromango, New Hebrides, May 10th, 1875.

The white bands on the under surface of secondaries are not separated at such equal distances as in *L. ælianus*.

27. *LAMPIDES ARGENTINA* ♀, Prittwitz.

Tanna, New Hebrides, 23rd April, 1875.

A rare species, of which we previously only possessed the male.

28. *LAMPIDES PERASIA* ♂, ♀, Felder.

Tanna, New Hebrides, 23rd April, 1875.

29. *LYCÆNA PHŒBE*, Murray.

Vaté or Sandwich Island, New Hebrides, 28th April, 1875 ;  
Erromango, New Hebrides, May 1875.

The undescribed *L. communis* of Herrich-Schäffer is this species, of which I believe his *L. alsulus* to be only a dark female. We obtained most of his South-Sea *Lycænidae* from the Godeffroy Museum.

30. *LYCÆNA CADUCA*, n. sp.

Wings above lilac, primaries with the costa, apex, and outer margin broadly dusky ; secondaries with the costal half and outer margin dusky ; a submarginal series of blackish dots, margined internally by sordid white lunules : body grey ; antennæ black, annulated with white : wings below pale grey, fringes long, tipped with grey ; primaries with a spot at end of cell, a discal transverse series of six spots, and a submarginal series bounded internally by a connected series of lunules, all dusky brownish, edged with white ; secondaries with a spot at end of cell surrounded by an irregular double series of spots, and a submarginal series bounded by lunules internally, all coloured as in primaries ; body below white : expanse of wings 9 to 10 lines.

Erromango, New Hebrides, May 1875.

This is one of the smallest of the blues ; it seems most nearly to approach the *L. knysna* group.

31. *SCOLITANTIDES EXCELLENS*, n. sp. (Plate LXVII. figs. 1, 2).

Allied to *S. cleotas*, but differing in the male having the purple colour spread over the primaries and the centre of secondaries, in the absence of a black spot at end of discoidal cell, the black veins, and the smaller orange patch on the secondaries.

♂. Above shining dull violet, veins black ; primaries with the outer margin narrowly greyish black ; secondaries with the costal area grey, outer margin narrowly black, preceded on discoidal median and interno-median interspaces by a sinuated quadrifid orange patch ; abdominal margin grey ; body blackish, abdomen with whitish margins to the segments ; antennæ black, annulated with white : eyes with a white zone ; palpi white below : wings below grey.

crossed by large white-edged black spots, nearly as in *S. cleotas*; secondaries with a large orange patch; body below sordid white: expanse of wings 1 inch 5 lines.

♀. Black-brown above, with larger orange patch in secondaries; otherwise as in the male: expanse of wings 1 inch 6 lines.

Tanna, New Hebrides, 3rd April, 1875.

32. *TERIAS SULPHURATA*, n. sp.

Nearly allied to *T. cesiope*, but of a sulphur- rather than a saffron-yellow colour, the black margin of primaries also more perpendicular above the sinus and consequently slightly narrower towards the costa; markings below not so much pronounced, but otherwise very like: expanse of wings 1 inch 9 lines.

Maré, Loyalty group, May 1875. (Two examples.)

33. *TERIAS VARIATA*, n. sp.

Only differs from the preceding in its much smaller size: expanse of wings 1 inch 3 to 4 lines.

Erromango, New Hebrides, 10th May, 1875.

Three examples of this form came, but much injured. Mr. Perry remarks that they seem to be very common all over the New Hebrides; he, however, confounds the following small species with them, the differences being slight between the various species in this genus.

34. *TERIAS HEBRIDINA*, n. sp. (Plate LXVII. fig. 8.)

Very like *T. senegalensis*, but of a more sulphurous tint, smaller, and with the black border of primaries continued as a quadrate spot along inner margin as in *T. hecabe*: expanse of wings 1 inch 5-6 lines.

Tanna, New Hebrides, 23rd April, 1875; Erromango, New Hebrides, 10th May, 1875.

Five examples of this species came. It is probably the *T. hecabe* of Herrich-Schäffer, and consequently of my list, although not the same as the Australian example mentioned by me as in the British-Museum collection.

35. *TERIAS INANATA*, n. sp.

Only differs from the preceding in the entire absence of markings on the under surface of the wings: expanse 1 inch 5 lines.

♂, Mota Island, 5th May, 1875; ♀, Erromango, 10th May, 1875.

36. *TERIAS PUMILARIS*, n. sp. (Plate LXVII. fig. 7.)

Sulphur-yellow; primaries with the costal margin blackish, outer margin rather broadly and regularly brown-bordered, the border being bisinuated within the median interspaces; secondaries with brown spots at terminations of the nervures, sometimes concurrent; body blackish: wings below paler yellow; nervures terminating in black dots; an annular marking at the terminations of the discoidal cells; secondaries with an annular marking on the subcostal area near the

base ; body pale dull yellow : expanse of wings 1 inch to 1 inch 3 lines.

Tanna, New Hebrides, 23rd April, 1875 ; Vaté, New Hebrides, 30th April, 1875.

This species belongs to the *T.-hecabe* group, but differs from all its allies in its narrow elongated primaries with more rounded apex : the sinuation of the outer border is also much less marked ; so that the insect has a very different aspect.

### 37. CATOPSILIA LACTEA, Butler.

♂, ♀, Erromango, New Hebrides, 10th May, 1875.

The male is too much worn to be placed in the collection ; but the female is quite fresh ; in all probability therefore the male appears a month or so earlier than the female, as in many other butterflies.

### 38. BELENOIS PERISTHENE ♂, ♀, Boisduval.

Erromango, New Hebrides, May 10th, 1875.

Mr. Perry says that he "observed this butterfly in Maré Island, Loyalty group." It seems to be a common species.

### 39. BELENOIS NABIS ♂, ♀, Lucas.

Vaté, 28th and 30th April, 1875 ; Erromango, New Hebrides, 10th May, 1875.

The series sent by Mr. Perry (one pair of which was taken *in copulá*), clearly demonstrates its identity with *B. periclea* of Felder.

### 40. PAPILIO HYPsicLES, Hewitson.

Tanna, New Hebrides, 23rd April, 1875.

The example sent is smaller than the typical form, and does not show the orange submarginal lunules on upper surface of secondaries.

### 41. PAPILIO ABSTRUSUS, n. sp.

Wings above black, fringe varied with cream-colour ; primaries with a narrow postmedian oblique cream-coloured band separated into seven divisions by the nervures, a subapical cream-coloured litura, and five other less distinct squamose submarginal lituræ ; secondaries with a rather large cream-coloured patch, beginning at costal nervure (where it is narrow) and continued to the base of the second median interspace, angularly irregular on its outer edge, and having six divisions owing to its crossing the end of the cell ; two elongated squamose creamy submarginal lunules between the tail and anal angle ; tail rather short, scarcely spatulate ; a deep crimson spot on inner margin, just below the abdominal fold : body deep brown, head, collar, and margins of tegulæ spotted with sordid pale yellow ; antennæ black : wings below black, fringe varied with cream-colour, nervures at base and several parallel diverging lines from the base of the discoidal cells pale yellow ; primaries with postmedian band and subapical spot broader than on the upper surface seven, well-marked squamose cream-coloured submarginal lunules ; secondaries with the patch of upper surface continued as a narrow band to the inner

margin and bounding a large oval orange-red spot on inner margin ; between the red spot and the broad central part of the creamy band a few scattered blue scales ; a discal submarginal series of large spots orange-red with creamy lateral edges ; body dull brown, palpi, legs, and venter streaked with pale yellow : expanse of wings 3 inches 9 lines.

Maré, Loyalty group, May 1875.

This is a most puzzling species : above it has somewhat the aspect of *P. nephelus* with the hind-wing spot of *P. helenus* ; but below it agrees better with *P. godeffroyi* than with any other *Papilio* at present known to me.

With the preceding collection of butterflies Mr. Perry sent three examples of a small Homopterous insect closely allied to *Tarandia australis* of Walker, from Vaté Island. He says, "This insect was found numerous under the leaves of shrubs in dark parts of the bush."

#### EXPLANATION OF PLATE LXVII.

Fig. 1. } <i>Scotitantides excellens</i> , p. 616.	Fig. 6. <i>Danaïs hebridésia</i> , p. 610.
2. } <i>Diadema perryi</i> , p. 613.	7. <i>Terias pumularis</i> , p. 617.
3. } <i>Lampides carissima</i> , p. 615.	8. — <i>hebridina</i> , p. 617.
4. }	
5. }	

### 7. On a small Collection of Butterflies from Fiji.

By ARTHUR G. BUTLER, F.L.S., F.Z.S., &c.

[Received October 20, 1875.]

Mr. W. Wykeham Perry has recently sent us the Lepidoptera obtained during his late visit to the Fiji Islands—thirteen examples, referable to six species, as follows :—

Family NYMPHALIDÆ.

Subfamily DANAINÆ.

Genus EUPLŒA, Fabricius.

1. EUPLŒA PROSERPINA, Butler (four examples, nn. 266–269).

♂, Ovalau 30th June, 1875 ; ♂ ♀ *in copula*, Vanua Levu, 3rd July.

I had not previously seen the female of this species ; it is rather larger than the male, and the secondaries are slightly paler in tint ; all the white spots are larger, the inner margin of primaries straighter, and the silky streak is absent.

Subfamily SATYRINÆ.

Genus XOIS, Hewitson.

2. XOIS SESARA, Hewitson (two examples, nn. 263, 264).

♂ ♀, Ovalau, 30th June, 1875.

This is a very common species.

## Subfamily NYMPHALINÆ.

## Genus JUNONIA, Hübner.

## 3. JUNONIA VILLIDA, Fabricius (one example, n. 265).

♀, Ovalau, 30th June, 1875.

Also a common species.

## Genus DIADEMA, Boisduval.

## 4. DIADEMA PALLESCENS, Butler (two examples, nn. 259 &amp; 261).

♂, Ovalau, 30th June, 1875.

The male was not previously in the Museum collection; it is most like *D. alcmena*, but smaller, with smaller bluish spots above; below the primaries are redder at the base, and have an oblique postmedian band (as in the male of *D. nerina*); the secondaries also differ in the smaller submarginal whitish spots, and in having a white central band: expanse of wing 3 inches 6 lines.

## Family LYCÆNIDÆ.

## Genus LAMPIDES, Hübner.

## 5. LAMPIDES CANDRENA, Herrich-Schäffer (two examples, nn. 270 &amp; 271).

♂, Vanua Levu, 3rd July, 1875.

## Family PAPILIONIDÆ.

## Genus PAPILIO, Linnaeus.

## 6. PAPILIO SCHMELTZI, Herrich-Schäffer (two examples, nn. 260 &amp; 262).

♂, Ovalau, 30th June, 1875.

Both examples of this rare and handsome species are in good condition. It is highly satisfactory to have thus obtained Dr. Herrich-Schäffer's species from the typical localities. I am also interested to see that the *Diadema auge* of that author (but not of Cramer) is my *D. pallescens*; for it is additional evidence of the constancy of the latter species: his remarks respecting it are as follows:—

“Jedenfalls nur aberratio, im Habitus und der Zeichnungsanlage ganz mit *polymena* Fld. Nov. t. 55. f. 5, 6 übereinstimmend, aber beiderseits ohne schwarzen Streif vor dem Saume. Die O Seite ist schmutzig ockergelb, gegen die W braun, an der kleineren Spitzenhälfte der Vfl und hinter der Zelle der Hfl weisslich. Unten in Z 1 b und 2 vor dem Saume ein weisser, dunkel umzogener Quersleck.”

The above description suits *D. pallescens* ♀ in all respects, excepting, perhaps, the part relating to the spot in cells 1 b and 2, which may or may not be correct, seeing that it is impossible to guess what cells are meant.

8. Descriptions of several new Species of *Sphingidæ*.

By ARTHUR G. BUTLER, F.L.S., F.Z.S., &amp;c.

[Received October 20, 1875.]

## Genus PROSERPINUS, Hübner.

## 1. PROSERPINUS ÆNOTHEROIDES, n. sp.

Size, form, and pattern of *P. ænotheræ*, but the primaries greyish white, with the band and subapical spot dull brownish ochreous, and the external area yellowish olivaceous; black band of secondaries rather narrower; body grey, with the crest, middle of collar, tegulæ, and dorsum ochraceous; antennæ shorter: wings below paler, with all the markings ochraceous or yellowish olivaceous instead of olive-green; fringe of primaries and discoidal area brown: expanse of wings 1 inch 10 lines.

Brazil.

Type, B.M.

If we had not obtained this from a collection of Brazilian Sphinges, and labelled "Brazil," I should have considered it merely a pale variety of *P. ænotheræ*; as it is, I can only consider it a geographical form of that species.

## Genus LOPHURA, Walker.

## 1. LOPHURA HIMACHALA, n. sp.

Allied to *L. masuriensis*, differs as follows:—altogether darker, the primaries with a black waved band from just beyond the end of the cell to the outer margin, where it expands and curves downwards to the external angle; an irregular external black marking from apex to first projection of outer margin; all the pale markings obsolete; secondaries with the outer border blacker and slightly narrower; outer margin waved, but not undulated; expanse of wings 1 inch 8 lines.

N.E. Himalayas (*Farr*).

Type, coll. F. Moore.

## 2. LOPHURA SANGAICA, n. sp.

Also allied to *L. masuriensis*; primaries much browner; a large slightly paler area, bordered by a blackish line, situated upon the inner margin; the dark line runs from external angle in a curve to end of cell, and then obliquely downwards to the middle of the inner margin; all the pale markings obsolete; secondaries with the external border more uniformly dark brown, not undulated, only half the width, not reaching the anal angle, but terminating in a small blackish spot; body greyish, markings not defined: expanse of wings 1 inch 7 lines.

Shanghai.

Type, coll. F. Moore.

## 3. LOPHURA EREBINA, n. sp.

Nearly allied to the preceding, differs from *L. masuriensis* as follows:—primaries blackish brown, black transverse lines less distinct, pale markings obsolete; secondaries with outer border much darker,

about half the width, abruptly failing just before anal angle, outer margin not undulated; body greyish, markings obsolete: expanse of wings 1 inch 7 lines.

N.W. India.

Type, coll. F. Moore.

### Genus PERGESA, Walker.

#### 1. PERGESA MONGOLIANA, n. sp.

Like a small example of *P. velata* from Darjeeling, but differing as follows:—central band of primaries above much less defined, more oblique, touching the inner margin at external angle, only black at its lower extremity; remainder of the wing decidedly darker, so as to obscure the markings; discal area pale towards the apex and (in two diffused spots) between first and second median interspaces; secondaries with the pale streak sharply defined at anal angle, where it forms a distinct, triangular, ochraceous spot; eyes and tegulæ clearly bordered with white; sides of coxæ and venter dull rose-colour: primaries below with outer brown border wider, paler areas red, a yellow patch towards apex, and a diffused yellow spot on second median interspace; secondaries red, greyish on interno-median area, costa tinted with yellowish: expanse of wings 2 inches 2 lines.

Nankow Pass, between Mongolia and China (*Swinhoe*).

Type, B.M.

The following is a description of the metamorphoses, from drawings made by a native Japanese artist under the superintendence of Mr. George Lewis:—

*Larva*. Whity brown at the sides, becoming gradually sandy brown towards the dorsal region, which is of a still deeper tint; the sixth and succeeding segments reticulated with dark brown; anterior portion of dorsal region on each of these segments obliquely blackish, quite black in front of the horn, which is normal in shape and testaceous; anterior segments slightly deeper in colour, with two lateral longitudinal lines, the inferior one indistinct and brown, the superior one black and terminating on the fifth segment in a large bipinnulated black ocellus with yellowish iris and black margin; a subdorsal blackish litura on the anterior segments; head, venter, and claspers greyish brown, spotted with whitish; the feet black; thoracic legs testaceous: length 3 inches 1 line.

*Pupa*. Whity brown, clouded with grey, and mottled with whitish below (particularly in front); anterior portion of segments reddish; a lateral longitudinal series of black spiracular spots, with whitish borders: length 1 inch 5 lines.

The larva feeds upon balsam.

*P. mongoliana* appears to be not uncommon in Japan, and probably occurs also in China; the larva is not unlike the darker form of *Chærocampa lewisii*.

### Genus CHÆROCAMPA, Duponchel.

#### 1. CHÆROCAMPA PRUNOSA, n. sp.

Nearly allied to *C. rosina*, the wings longer and narrower, altogether



much darker in colouring; primaries much more grey in tint; costal margin pale brown, not white; all the bands narrower, the pale lines, and the broad pale band much narrower, the latter intersected down the centre (not within its inner half) by a brown line; secondaries almost black, the red band much deeper in colour and half the width; body darker; the sides of the abdomen brassy rather than reddish golden: wings below darker, external border much greyer; sides of venter more yellowish golden: expanse of wings 3 inches.

Ceylon (*Skinner*).

Type, coll. F. Moore.

This is a well-marked southern representative of *C. rosina*.

## 2. *CHEROCAMPA PUELLARIS*, n. sp.

Nearly allied to *C. oldenlandiæ*, considerably smaller, and altogether paler in colouring; primaries comparatively broader and shorter; the bands broader and slightly waved; secondaries with the pale band wider and whity brown; body with the bands broader, silvery border of tegulæ strongly marked: wings below paler, external border whiter; pectus whiter, venter without longitudinal central whitish streak: expanse of wings 2 inches.

Rawul Pindi (*Hellard*).

Two examples, coll. F. Moore,

This is a well-marked and interesting little species.

## 3. *CHEROCAMPA INTERSECTA*, n. sp.

Nearly allied to *C. silhetensis*, but narrower in the wings; the black oblique band of primaries narrower and straighter; the pale buff band almost immediately following it considerably narrowed, owing to the fact that the innermost of the five discal dusky lines is placed further from the margin, and consequently runs exactly through its centre; pale rosaceous band of secondaries broader, more uniform in width; body darker above, lateral streak on abdomen less golden, dorsal line more silvery; markings below less defined: expanse of wings 2 inches 6 lines.

Queensland (*Janson*).

Type, B.M.

This is evidently the Australian representative of *C. silhetensis*.

## Genus *DILUDIA*.

Under this genus I should wish to correct an error which has accidentally crept into a former paper.

P. Z. S. 1875, p. 260, n. 57: For *Diludia rufescens*, read *Diludia rubescens*.

This is important, as the name *rufescens* has been used before.

## 9. On the Herons of the Argentine Republic, with a Notice of a curious Instinct of *Ardetta involucris*. By W. H. HUDSON, C.M.Z.S.

[Received October 30, 1875.]

I have observed Herons a great deal, and am strongly inclined to adhere to Buffon's opinion that they are wretched, indigent birds,

condemned by the imperfections of their organs to a perpetual struggle with misery and want.

Much as the different species vary in size, from the *Ardea cocoi* to the diminutive Variegated Heron of Azara (*Ardetta involucris*), no bigger than a Snipe, there is yet much sameness in their conformation, language, flight, nesting and other habits. They possess a snake-like head and neck, and a sharp taper beak, with which they transfix their prey as with a dart—also the serrate claw about which so much has been said, and which has been regarded as an instance of pure adaptation. A curious circumstance has come under my observation regarding Herons. Birds in poor condition are very much infested with vermin; whether the vermin are the cause or effect of the poor condition, I do not know; but such is the fact. Now in this region (the Argentine Republic) Herons are generally very poor, a good-conditioned bird being a very rare exception; a majority of individuals are much emaciated and infested with intestinal worms; yet I have never found a bird infested with lice, though the Heron would seem a fit subject for them, and in the course of my rambles I have picked up many individuals apparently perishing from inanition. I do not wish to insinuate a belief that this immunity from vermin is due to the pectinated claw; for though the bird does scratch and clean itself with the claw, it could never rid the entire plumage from vermin by this organ, which is as ill adapted for such a purpose as for “giving a firmer hold on its slippery prey.”

The Spoonbill has also the serration, and is, unlike the Heron, an active vigorous bird, and usually fat; yet it is much troubled with parasites, and I have found birds too weak to fly and literally swarming with them.

I merely wish to call the attention of ornithologists to the fact that in the region where I have observed Herons, they are exempt in a remarkable degree from external parasites.

Much has also been said about certain patches of dense, clammy, yellowish down under the loose plumage of Herons. These curious appendages may be just as useless to the bird as the tuft of hair on its bosom is to the Turkey-cock; but there are more probabilities the other way, and it may yet be discovered that they are very necessary to its well-being. Perhaps these clammy feathers contain a secretion fatal to the vermin by which birds of sedentary habits are so much afflicted, and from which Herons appear so strangely free. They may even be the seat of that mysterious phosphorescent light which some one has affirmed emanates from the Heron's bosom when it fishes in the dark, and which serves to attract the fish, or to render them visible to the bird. Naturalists have, I believe, dismissed the subject of this light as a mere fable without any foundation of fact; but real facts regarding habits of animals have not unfrequently been so treated. Mr. Bartlett's interesting observations on the Flamingoes in the Society's Gardens, show that the ancient story of the Pelican feeding its young on its own blood is perhaps only a slightly embellished account of a common habit of the bird. The story of the scorpion “girt by fire” turning its weapon upon itself, may also be



J. Smit lith.

M & N Harbart sculp

GAZELLA CRANTI 1 ♀ 2 ♂



adduced ; for whenever naturalists who have the opportunity take pains to investigate the matter, they will find the so-called fable simple fact—also that some excessively irritable individuals do not require to be surrounded by fire, but will sting themselves to death when merely teased with a stick. The argument I have used is weak enough ; but until the contrary is conclusively shown, it is reasonable to assume that the clammy patches are of some advantage to the Heron.

I have not observed Herons fishing by night very closely ; but there is one fact inclines me to believe it probable that some species might possess the light-emitting power in question. I am satisfied that the *Ardea cocoi* possesses as keen a vision by day as any feathered creature, Raptores excepted : the streams on the level pampas are so muddy that a fish two inches below the surface is invisible to the human eye ; yet in these thick waters the Herons fish by night and by day. If the eye is adapted to see so well in the day, how can it see so well at night, and under such unfavourable circumstances, without some such extraneous aid to vision as the attributed luminosity ?

Heron, of all birds, fly the slowest ; but though incapable of progressing rapidly when moving directly forward, when pursued by a Raptor the Heron performs with marvellous ease and grace an aerial feat unequalled by any other bird, viz. that of rising vertically to an amazing height in the air. The marvellous ease and celerity with which the pursued ascends until it becomes a mere speck in the blue zenith, the hurried zigzag flight of the pursuer, rising every minute above its prey, only to be left below again by a single flap of the Heron's wings, forms a sight of such grace, beauty, and power that the mind of the beholder is filled with delight and astonishment. I believe these displays are unfrequent ; for I have spent many years in regions abounding in Hawks and Herons, and have very rarely seen a Heron attacked.

When the enemy comes to close quarters, the Heron instinctively throws itself belly up to repel the assault with its long crooked cutting claws. All Raptorial species possess a similar habit ; and the analogous correlation of habit and structure in genera otherwise so widely separated is very curious. The Falcon uses its feet to strike, lacerate, and grasp its prey ; the Heron to anchor itself firmly to its perch ; but for weapons of defence they are equally well adapted, and are used in precisely the same manner. The Heron, with its great length of neck and legs, its lean unballasted body, large wings and superabundance of plumage, is the least suited of birds to perch high ; but the structure of the feet renders it perfectly safe for it to do so. Thus the Heron is enabled to sit on a smooth enamelled rush, or on the summit of a tree, and doze securely in a wind that, were its feet formed like those of other waders, would blow it away like a bundle of dead feathers.

In the Variegated Heron (*Ardetta involucris*), the least of the tribe, the perching-faculty probably attains its greatest perfection, and is combined with locomotion in a unique and wonderful manner.

This little Heron frequents beds of reeds growing in rather deep water. Very seldom, and probably only accidentally, does it visit the land; and only when disturbed does it rise above the reeds; for its flight, unlike that of its congeners, is of the feeblest: but it lives exclusively amongst the reeds, that, smooth as a polished pipe-stem, rise vertically from water too deep for the bird to wade in. Yet the Heron goes up to the summit or down to the surface, and moves freely and briskly about amongst them, and runs in a straight line through them almost as rapidly as a Plover runs over the bare level ground.

Unless I myself had been a witness of this feat, I could scarcely have credited it; for how does it manage to grasp the smooth vertical reeds quickly and firmly enough to progress so rapidly without ever slipping downward through them? I will return anon to this bird to give an account of an instinct it possesses far more interesting than the one I have just recorded.

Another characteristic of Herons is that they carry the neck, when flying, folded in the form of the letter S. At other times the bird also carries the neck this way; and it is, indeed, in all long-necked species the figure the neck assumes when the bird reposes or is in the act of watching something below it; and the Heron's life is almost a perpetual watch. Apropos of this manner of carrying the neck, so natural to the bird, is it not the cause of the extreme wariness observable in Herons? - Herons are, I think, everywhere shy of disposition; with us they are the wildest of water-fowl; yet there is no reason for their being so, since they are never persecuted.

Birds ever fly reluctantly from danger; and all species possessing the advantage of a long neck, such as the Swan, Flamingo, Stork, Spoonbill, &c., will continue with their necks stretched to their utmost capacity watching an intruder for an hour at a time rather than fly away.

But in the Herons it must be only by a great effort the neck can be wholly unbent; for even if the neck cut out from a dead bird be forcibly straightened and then released, it flies back like a piece of india-rubber to its original shape. Therefore the effort to straighten the neck, invariably the first expression of alarm and curiosity, must be a painful one; and to keep it for any length of time in that position is probably as insupportable to the bird as to keep the arm straightened vertically would be to a man. Thus the Heron flies at the first sight of an intruder, whilst the persecuted Duck, Swan, or other fowl continues motionless, watching with outstretched neck, participating in the alarm certainly, but not enduring actual physical pain.

Doubtless in many cases habits react upon and modify the structure of parts; and in this instance the modified structure has apparently reacted on and modified the habits. In seeking for and taking food, the body is required to perform certain definite motions and assume repeatedly the same attitudes; this is most frequently the case in birds of aquatic habits. A facility for assuming at all times, and an involuntary falling into, these peculiar attitudes and gestures,

appears to become hereditary ; and the species in which they are most noticeable seem incapable of throwing the habit or manner off, even when placed in situations where it is useless or even detrimental. *Tringa* rapidly peck and probe the mud as they advance ; Plovers peck and run, peck and run again. Now I have noticed scores of times that these birds cannot possibly lay aside this habit of pecking as they advance ; for even a wounded Plover running from his pursuer over dry barren ground, goes through the form of eating by pausing for a moment every yard or so, pecking the ground, then running on again.

The *Scolopax frenata*, and probably other true Snipes, possesses the singular habit of striking its beak on the ground when taking flight. In this instance has not the probing motion, performed instinctively as the bird moves, been utilized to assist it in rising?

Grebes on land walk erect like Penguins, and have a slow awkward gait ; and whenever they wish to accelerate their progress, they throw themselves forward on the breast and strike out the feet as in swimming.

The Glossy Ibis feeds in shallow water, thrusting its great sickle beak into the weeds at the bottom at every step. When walking on land it observes these motions, and seems incapable of progressing without plunging its beak downwards into imaginary water at every stride.

The Spoonbill wades to its knees and advances with beak always immersed and swaying itself from side to side, so that at each lateral movement of the body the beak describes a great semicircle in the water ; a flock of these birds feeding reminds one of a line of mowers mowing grass. On dry ground, the Spoonbill seems unable to walk directly forward like other birds, but stoops, keeping the body in a horizontal position, and, turning from side to side, sweeps the air with its beak, as if still feeding in the water.

In the foregoing instances (and I could greatly multiply them), in which certain gestures and movements accompany progressive motion, it is difficult to see how the structure can be in any way modified by them ; but the preying attitude of the Heron, the waiting motionless in perpetual readiness to strike, has doubtless given the neck its very peculiar form.

Two interesting traits of the Heron (and they have a necessary connexion) are its tireless watchfulness and its insatiable voracity ; for these characters have not, I think, been exaggerated even by the most sensational of ornithologists.

In birds of other genera, repletion is invariably followed by a period of listless inactivity during which no food is taken or required. But the Heron digests his food so rapidly that, however much he devours, he is always ready to gorge again ; consequently he is not benefited by what he eats, and appears in the same state of semi-starvation when food is abundant as in times of scarcity. An old naturalist has suggested as a reason for this, that the Heron, from its peculiar manner of taking its prey, requires fair weather to fish—that during spells of bad weather, when it is compelled to suffer the

pangs of famine inactive, it contracts a meagre consumptive habit of body, which subsequent plenty cannot remove. A pretty theory; but it will not hold water; for in this region spells of bad weather are brief and infrequent; moreover all other species that feed at the same table with the Heron, from the little flitting *Ceryle* to the towering Flamingo, become excessively fat at certain seasons, and are at all times so healthy and vigorous that, compared with them, the Heron is but the ghost of a bird. In no extraneous circumstances, but in the organization of the bird itself must be sought the cause of its anomalous condition: it does not appear to possess the fat-elaborating power; consequently no provision is made for a rainy day, and the misery of the bird consists in its perpetual, never-satisfied, craving for food.

Some writers have expatiated on the extreme insensibility and apathy of the Heron, even charging it with neglect of self-preservation. This is not true; Herons have as keen a sense of danger as other birds, and their insensibility is only apparent.

We have seen how the Spoonbill, Ibis, and other species, when out of the water, continue to observe motions and assume attitudes practised when feeding; yet these birds require to be active, have a variety of movements and satisfy their hunger in less time than the Heron. The Heron has but one attitude, motionless watchfulness; so that when not actually on the wing or taking the few desultory steps it occasionally ventures on, and in whatever situation it may be placed, the level ground, the summit of a tree, or in confinement, it is seen drawn up, motionless and apparently apathetic.

But when we remember that this is the bird's attitude during many hours of the night and day, when it stands still as a reed in the water—that in such a posture it sees every shy and swift creature that glances by it, and darts its weapon with unerring aim and lightning rapidity, and with such force that I have seen one drive its beak quite through the body of a fish very much too large for the bird to swallow and cased in bony armour, it is impossible not to think that it is observant and keenly sensible of every thing going on about it.

I have made myself partially acquainted with the habits of eight of our Herons; but there is such a sameness in the way of life of these birds that most of what I could say about them would read like a mere repetition of what has been recorded concerning other species.

The Cocoli (*Ardea cocoi*) and the Common Heron of Europe, widely separated as are the continents they inhabit, are identical in habits.

The Argentine *Nycticorax* has one curious habit, but, apart from this, is like the Night-Herons found elsewhere. It lives in colonies of often more than fifty individuals, and perches aloft by day where trees abound; but the bird is also common in the marshes on the treeless pampas. Here the Night-Heron constructs platforms to perch on by breaking and bending the reeds across each other; this false nest is about a foot in diameter and ten or fifteen inches above the water.

A pair of Cocolis frequenting a stream close to a house I once lived



in several months, built two false nests on the water, ten or twelve yards from the shore.

It is worthy of notice that the *Myopotamus coypus* has a similar habit. The Coypus make great burrows in the banks of the water-courses they inhabit, but appear to use them, at least where there are reeds, only as a refuge from danger and to bring forth their young in; for they also build platforms of reeds and pass the day lying on them. In some watercourses in Patagonia the Coypu (and it is there a third larger than the variety found on the pampas) has quite dropped the burrowing habit, doubtless on account of the sand and gravel soil, and lives entirely amongst the reeds, the female bringing forth her young on the reed platforms or nests.

I will give a fuller account of the little Variegated Heron, *Ardetta involucris* (Vieill.)\*, and particularly of its instinct of self-preservation.

The Variegated Heron is a silent solitary bird, frequents the marshy borders of the Plata, and is occasionally found in the reed-beds scattered over the pampas. It breeds amongst the close-growing rushes, and lays three spherical eggs of a rich lively green and beautiful beyond comparison.

The nest is a simple platform structure several inches above the water, and so very small that there hardly seems room enough on it for the eggs, which are very large for the bird. When one looks down upon them, they cover and almost hide the nest from view, and, furthermore, being green like the surrounding rushes, are not easy to discover.

When driven from its haunt, the bird flies eighty or a hundred yards off, and drops again amongst the rushes; it is difficult to flush it a second time, but a third impossible. And a very curious circumstance is that it also seems quite impossible to find the bird in the spot where it finally settles. Being found in places where one can only enter on horseback, I could never succeed in shooting specimens when I wanted them, and was obliged to employ some Gancho boys, who had dogs trained to hunt young ducks, to try for the little Heron. They procured me a few specimens, and told me that, without the aid of their dogs, they could never succeed in finding the bird, though they always marked the exact spot where it alighted. This I attributed to the slender figure it makes, and to the colour of the plumage so closely resembling that of the withering yellow and spotted reeds always to be found amongst the green ones; but I did not know for many years that the bird possessed a marvellous

\* In a paper by Messrs. Sclater and Salvin on Buenos-Ayres birds, published in the Society's 'Proceedings' (1869, p. 634), *Ardetta erythromelas* is given as a synonym of *A. involucris*; but it is added:—"We are, however, inclined to doubt very much whether this is really the young of *A. erythromelas*, as referred by Bonaparte, Burmeister, and other authors, and prefer waiting for other examples before arriving at a definite conclusion on this point." Closely as the two birds are related in form and colour, the difference in size might well induce a doubt as to their being merely the young and adults of one species. In Buenos Ayres *A. involucris* is not uncommon, but I have never met with *A. erythromelas*, nor do I believe it ranges so far south.

instinct that made its peculiar conformation and imitative colour far more advantageous than they could be of themselves.

One day in November 1870, when out shooting, I noticed a little Heron stealing off quickly through a bed of rushes, thirty or forty yards from me; he was a foot or so above the ground, and went so rapidly that he appeared to glide through the rushes without touching them. I fired, but afterwards ascertained that in my hurry I missed my aim. The bird, however, disappeared at the report; and thinking I had killed him, I went to the spot.

It was a small isolated bed of rushes I had seen him in; the mud below and for some distance round was quite bare and hard, so that it would have been impossible for the bird to escape without being perceived; and yet, dead or alive, he was not to be found. After vainly searching and researching through the rushes for a quarter of an hour, I gave over the quest in great disgust and bewilderment, and, after reloading, was just turning to go, when, behold! there stood my Heron on a reed, no more than eight inches from, and on a level with, my knees. He was perched, the body erect and the point of the tail touching the reed grasped by its feet; the long slender, tapering neck was held stiff, straight and vertically; and the head and beak, instead of being carried obliquely, were also pointing up. There was not, from his feet to the tip of the beak, a perceptible curve or inequality, but the whole was the figure (the exact counterpart) of a straight tapering rush: the loose plumage arranged to fill inequalities, the wings pressed into the hollow sides, made it impossible to see where the body ended and the neck began, or to distinguish head from neck or beak from head. This was, of course, a front view; and the entire under surface of the bird was thus displayed, all of a uniform dull yellow like that of a faded rush. I regarded the bird wonderingly for some time; but not the least motion did it make. I thought it was wounded or paralyzed with fear, and, placing my hand on the point of its beak, forced the head down till it touched the back; when I withdrew my hand, up flew the head, like a steel spring, to its first position. I repeated the experiment many times with the same result, the very eyes of the bird appearing all the time rigid and unwinking like those of a creature in a fit. What wonder that it is so difficult, almost impossible, to discover the bird in such an attitude! But how happened it that while repeatedly walking round the bird through the rushes I had not caught sight of the striped back and the broad dark-coloured sides? I asked myself this question, and stepped round to get a side view, when, *mirabile dictu*, I could still see nothing but the rush-like front of the bird! His motions on the perch as he turned slowly or quickly round, still keeping the edge of the blade-like body before me, corresponded so exactly with my own that I almost doubted that I had moved at all. No sooner had I seen the finishing part of this marvellous instinct of self-preservation (this last act making the whole entire), than such a degree of delight and admiration possessed me as I have never before experienced during my researches, much as I have conversed with wild animals in the wilderness, and many and perfect as are the in-





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U. F. n. sch. del. J. Smith lith.

M & N Hanhart imp.

GOURA SCHEEPMAKERI

stances of adaptation I have witnessed. I could not finish admiring, and thought that never had any thing so beautiful fallen in my way before; for even the sublime cloud-seeking instinct of the White Egret and the typical Herons seemed less admirable than this; and for some time I continued experimenting, pressing down the bird's head and trying to bend him by main force into some other position; but the strange rigidity remained unrelaxed, the fixed attitude unchanged. I also found, as I walked round him, that, as soon as I got to the opposite side and he could no longer twist himself on his perch, he whirled his body with great rapidity the other way, instantly presenting the same front as before.

Finally I plucked him forcibly from the rush and perched him on my hand, upon which he flew away; but he flew only fifty or sixty yards off, and dropped into the dry grass. Here he again put in practice the same instinct so ably that I groped about for ten or twelve minutes before refinding him, and was astonished that a creature to all appearance so weak and frail should have strength and endurance sufficient to keep its body rigid and in one attitude for so long a time.

## 10. On a new Species of Crown-Pigeon.

By OTTO FINSCH, Ph.D., C.M.Z.S.

[Received November 8, 1875.]

(Plate LXVIII.)

GOURA SCHEEPMAKERI, sp. nov. (Plate LXVIII.)

Slate-blue; wings and tail darker, the latter with a broad ashy apical margin; crop and breast of a dark vinaceous purplish brown; vent, lower flanks, and under tail-coverts of a lighter slate-blue than the upper parts; wings and tail at the inner webs and from below slate-black; the first six wing-coverts of the secondaries whitish ashy, narrowly tipped with blackish, the remaining coverts of the secondaries slate-black like the first row of the upper wing-coverts; the light whitish ashy area on the middle of the wing therefore margined above by a broad black cross band; remaining upper wing-coverts blackish, with dark slate-grey apical margins, the upper wing-coverts therefore darker than the back; lower wing-coverts slate-black; lores and eye-region black, forming a conspicuous area which extends to the base of the crown-feathers; a very high and compressed semicircular crest of a pale ashy colour passing into whitish ashy under certain lights, at the base bluish ashy; this crown, of which the longest feathers are about  $5\frac{3}{4}$  inches long, is composed in the same manner as in *G. coronata*, by the hairy radii being disunited and dispersed from the straight rachis in an acute angle. Bill dark horn-colour, with a pale tip; feet blackish brown, toes lighter, nails blackish.

Long. alae.	caud.	culm.	riet.	tars.	dig. med.	ung.
12 <sup>'''</sup> 6 <sup>'''</sup>	9 <sup>'''</sup>	10 <sup>'''</sup>	23 <sup>'''</sup>	3 <sup>'''</sup> 2 <sup>'''</sup>	19 <sup>'''</sup>	7 <sup>'''</sup>

The specimen above described I obtained by chance from a dealer in Holland. When at the Gardens of the Zoological Society at Amsterdam, Mr. Westerman called my attention to a living specimen of *Goura*, which he believed to be new\*, and which proved to be of the same species as my specimen. From my description, however, this specimen differs in some respects, having the throat and the smaller upper wing-coverts also vinaceous purplish brown, and the anterior coverts of the secondaries more decidedly whitish and tipped with purplish brown; otherwise the specimens agree in every respect. These differences probably depend on age or sex.

In the living bird the eyes are deep red, the legs and feet red, the bill blackish with pale tips.

This remarkable new Crown-Pigeon is intermediate between the two known species. It agrees with *G. victoriae* in size and the coloration of the underparts, but differs in the composition of the crown-feathers, which exactly resemble those of *G. coronata*. In *G. victoriae* these feathers are totally different, having a regularly webbed triangular disk at the apex, bordered very distinctly at the tip with white. *G. coronata*, of which the Leyden Museum possesses a series of nineteen specimens, never has the throat and breast purplish brown, but, on the contrary, has the back of this colour. As we know from the interesting account of Mr. Mitchell (P. Z. S. 1849, p. 169, t. xii.), *G. coronata* (male) and *G. victoriae* (female) paired and produced a hybrid in the Gardens of this Society, which unfortunately died in a few days. Having regard to this fact we might incline to believe this new *Goura* to be a hybrid; but if this were really the case, the formation and composition of the crown-feathers would no doubt prove to be intermediate between those of the two parents. This is not the case in my specimen, which, in regard to the crest, agrees throughout with *G. coronata*; and so I cannot believe it to be a hybrid. I may remark that *G. coronata* shows great variation in colour according to its localities. Specimens from Sorong, on the west coast of New Guinea, opposite the island Salawatti, have the sides of head and nearly the whole of the under surface black; and this is also the case in specimens from the island of Waigiou (*G. coronata minor*, Schleg.) and from Mysol ("abdomen et bas-ventre noir," Schlegel). But as between these black-varied specimens and those in the ordinary dress, there are many intermediate forms, and as, on the other hand, both forms occur in the same locality, I do not venture to consider the black-bellied form a distinct species.

Following the wishes of my esteemed friend Mr. Westerman, who wishes to express the feelings of thanks of himself and of the Royal Zoological Society of Amsterdam, I have the pleasure of naming this new species after Mr. C. Scheepmaker, of Soerabaya, who has presented to the Society many rare animals, and to whom also belongs the credit of having sent home the first specimens of this interesting new *Goura*.

Although the exact localities of my specimen and of that in the

\* See notice of the same bird by Mr. Selater, P. Z. S. 1875, p. 380.

Amsterdam Gardens are unknown, I am fortunate in being able to give the south end of New Guinea, opposite Yule Island, as the true habitat of *Goura scheepmakeri*, having been kindly informed by Mr. Sclater that several specimens of it are contained in the last collection sent to the Civic Museum of Genoa, by the indefatigable Italian traveller Signor d'Albertis, from that locality.

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December 7, 1875.

George Busk, Esq., F.R.S., V.P., in the Chair.

The following report on the additions to the Society's Menagerie during the month of November 1875 was read by the Secretary:—

The total number of registered additions to the Society's Menagerie during the month of November 1875 was 98, of which 2 were by birth, 35 by presentation, 38 by purchase, 4 by exchange, and 19 were received on deposit. The total number of departures during the same period, by death and removals, was 124.

The most noticeable additions during the month were:—

1. A female Beisa Antelope (*Oryx beisa*) from Eastern Africa, presented by H.H. the Sultan of Zanzibar, and received November 8, 1875. This addition is the more welcome, as it makes a pair to the male of the same species presented by Admiral A. Cumming, R.N., in 1874. I believe that this is the only pair of this fine Antelope in Europe.

2. Two All-Green Tanagers (*Chlorophonia viridis*) from Brazil, purchased November 16, 1875. This species is new to the collection, and has not, so far as I know, been previously received in a living state.

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Mr. Sclater exhibited a skin of *Hypocolius ampelinus*, Bp. (Consp. i. p. 336; Heuglin, Ibis, 1868, p. 181, pl. v.), which had been obtained by Mr. W. T. Blanford at Mazátáni Nai, in Upper Scinde, to the west of Shikarpúr, in March 1875, as already recorded by Mr. Blanford in 'The Ibis,' 1875, p. 388. M. Oustalet, of the Muséum d'Histoire Naturelle, Jardin des Plantes, Paris, had kindly compared this specimen with an adult male example from Sennaar, received from M. Botta (the original discoverer of this curious bird) in 1839, and had found them completely identical. M. Oustalet stated that there were three mounted specimens of *Hypocolius ampelinus* in the Gallery of the Paris Museum, received from M. Botta.

Mr. Sclater remarked that this discovery was of special interest, as a further proof of the extension of some of the most characteristic types of the Æthiopian Fauna into Western India.

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Mr. Sclater read an extract from a letter addressed to him by

Mr. H. A. Wickham, dated Piquiahiba, near Santarem, Brazil, July 31, 1875.

Mr. Wickham said, "It may interest you to know that the large blue Hyacinth Macaw (*Ara hyacinthina*) is to be found much nearer Santarem than has been hitherto supposed. I have just been for a three days' hunt through the forest covering the tableland south of this place towards the Curuá river. Along the sides of a water-course we traversed, these birds appeared to be quite common, their peculiar quavering caw being constantly heard; but so local did they seem to be, that five or six miles further on we neither saw nor heard them."

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Prof. Owen read the twenty-second of his series of Memoirs on *Dinornis*, containing a restoration of the skeleton of *Dinornis maximus*, Owen.

This paper will be published in the Society's Transactions.

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The following papers were read:—

1. Description of a new Species of *Dolichotis*. By Dr. HERMANN BURMEISTER, Director of the National Museum, Buenos Aires, F.M.Z.S.

[Received September 20, 1875.]

. (Plate LXIX.)

The genus *Dolichotis*, one of the best-marked of the family *Caviini*, differs strikingly from the rest of the group in the great size of its ears. It was founded by Desmarest in 1822, the only known specimen having been first described by Azara under the Spanish name *Liebre patagona*. This animal is well known its native country under the last name, and is common in the districts of Upper Patagonia, near the Rio Negro, and in the western provinces of St. Luis and Mendoza, but was long rare in European collections.

The investigations of Darwin, Waterhouse, and myself (*Reise durch die La Plata-Staaten*, tom. ii. p. 422) have given full particulars as to its habits, external characters, and anatomy, the last-named part of its organization having been shortly described in my work above referred to.

Till now no second species has been known; and I was therefore surprised on receiving an animal, obtained by Dr. C. Berg, the able inspector of the Public Museum, which resembled the Patagonian Hare, but which indicated by the still greater size of its ears a new species of *Dolichotis*.

It is strange that an animal as large as a common rabbit should have escaped the notice of scientific men in a country so much visited by travellers of late years; but as this animal lives in a region remote





H. Burmeister del. J. Smit lith.

M. & N. Harhart. imp.

DOLICHOTIS SALINICOLA.

